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Summary of the Animas-La Plata Project
Draft Supplemental Environmental Impact Statement

1.0 INTRODUCTION

The Department of the Interior (Interior), through the Bureau of Reclamation (Reclamation) and in cooperation with the U.S. Environmental Protection Agency (EPA), the Ute Mountain Ute and Southern Ute Indian Tribes (Colorado Ute Tribes), has prepared a Draft Supplemental Environmental Impact Statement (DSEIS). The DSEIS is prepared under the provisions of Public Law (P.L.) 93-638, the Indian Self Determination and Education Assistance Act. It evaluates the potential impacts of implementing the Colorado Ute Indian Water Rights Settlement Act of 1988 (P.L. 100-585) (Settlement Act). The Settlement Act, through construction of the Animas-La Plata Project (ALP Project), intended to provide the Colorado Ute Tribes an assured long-term water supply in order to satisfy the Colorado Ute Tribes senior water rights claims. Reclamation is now proposing to develop a modified ALP Project in southwestern Colorado and northwestern New Mexico for the purpose of finally implementing the Settlement Act. **Map 1** shows the ALP Project area. Reclamation and Interior now propose to construct a 120,000 acre-foot (af) reservoir in Ridges Basin near Durango and provide a water acquisition fund in order to meet the Settlement Act and other project purposes. The development of this proposed action and its alternatives are summarized in this report, and are more fully described in the DSEIS.

The ALP Project has been the subject of public interest and environmental review since it was authorized by the Colorado River Basin Project Act of 1968 (P.L. 90-537) and later incorporated into the Settlement Act. The ALP Project is a participating project under the Colorado River Storage Project Act and utilizes part of the streamflows allocated to Colorado and New Mexico by the Colorado River Compact of 1922 (P.L. 84-485) and the Upper Colorado River Basin Compact of 1948. These two compacts allocate water for development in the Colorado River Basin.

Reclamation, in compliance with the National Environmental Policy Act (NEPA), prepared a Final Environmental Statement (INT FES 80-18) for the ALP Project in 1980 (1980 FES), a Draft Supplement to the 1980 Final Environmental Statement (1992 DSFES) in 1992, and a Final Supplement to the Final Environmental Statement in 1996 (1996 FSFES). The proposed ALP Project described in the 1996 FSFES continued to generate controversy. As a result, then Colorado Governor Roy Romer and Lt. Governor Gail Schoettler convened both supporters and opponents of the ALP Project in an attempt to address unresolved issues and gain consensus on an alternative to the original project (Romer-Schoettler process), which would satisfy the Indian water rights confirmed by the Settlement Act.

As a result of the Romer-Schoettler process, a new structural and non-structural alternative evolved in August 1997. Under the structural alternative, called the Animas-La Plata Reconciliation Plan, the initial stage of the project as described in the 1996 FSFES would be constructed, including a proposed reservoir at Ridges Basin (near the City of Durango) that would store water from the Animas River. The reservoir was sized to provide amounts of water in excess of the depletions currently allowed under the existing Biological Opinion issued by the U.S. Fish and Wildlife Service (Service).[1] The non-structural

[1]The Service prepared a Biological Opinion on the project as it was proposed in 1996. The Service will prepare an updated opinion that will be included in the Final Supplemental Environmental Impact Statement on the proposed plan discussed in the DSEIS. A Biological Assessment has been prepared and submitted to the Service for use in preparing this Biological Opinion. Information in the DSEIS is based on the Biological Assessment, informal

alternative, referred to as the Animas River Citizen s Coalition Conceptual Alternative, focused on providing the Colorado Ute Tribes with funds to purchase water from existing projects, and/or the acquisition of existing direct flow water rights, as well as the use and/or modification of existing federal facilities.

No consensus was reached on any of the alternatives developed during the Romer-Schoettler process. As a result, on August 11, 1998, the Secretary of the Interior presented an Administration Proposal to implement the Settlement Act. The proposal calls for a down-sized dam and reservoir at Ridges Basin to supply municipal and industrial (M&I)[2] water to the Colorado Ute Tribes and other project beneficiaries e.g., the Navajo Nation, the Animas-La Plata Water Conservancy District (ALPWCD), and the San Juan Water Commission (SJWC). The proposal also contains a non-structural element as part of the settlement implementation (e.g., a fund to acquire water rights). Further, the ALP Project is sized to match the depletions permitted in the Reasonable and Prudent Alternatives (RPA) contained in the 1996 Biological Opinion for the ALP Project in compliance with the Endangered Species Act (ESA). This opinion limited the average water depletions to 57,100 acre-feet/year (afy).

Because these proposals represent a significant modification of the ALP Project evaluated previously, additional environmental analysis is required. On January 4, 1999, Reclamation announced its intent to prepare a DSEIS to the 1996 FSFES (*Federal Register* Volume 64, No. 1). The DSEIS analyzes various ways in which the Colorado Ute Tribal water rights may be settled. Following release of the DSEIS, public hearings will be held and a Final Supplemental Environmental Impact Statement (FSEIS) and Record of Decision will be prepared.

2.0 PROJECT HISTORY

The ALP Project was authorized by the Colorado River Basin Project Act of 1968 to be located in La Plata County in southwestern Colorado and in San Juan County in northwestern New Mexico. The ALP Project was designed to provide irrigation and M&I water supplies to the Colorado Ute Tribes and other project beneficiaries. A Colorado Ute Indian Water Rights Final Settlement Agreement (Settlement Agreement) was signed on December 10, 1986, which quantified the Colorado Ute Tribes water rights. The water rights allow the Tribes to obtain water from several rivers and projects, including water supplied from the ALP Project. In 1988, Congress incorporated the ALP Project into the Settlement Act in order to settle Colorado Ute Tribal water rights claims.

As a result of an 1868 treaty entered into between the United States and the Colorado Ute Tribes, the Tribes acquired a large reservation encompassing much of southwestern Colorado. That reservation provides the Colorado Ute Tribes with significant reserved water rights on rivers and streams throughout the region. The Colorado Ute Tribes water rights are senior to most non-Indian water rights in the region. In the absence of the Settlement Act, development of senior Tribal water rights claims could adversely impact non-Colorado Ute Tribal water rights and users, including cities, municipalities, federal land management agencies, and recreation uses throughout southwestern Colorado and northwest New Mexico.

consultation with the Service, and information and recommendations in the 1996 Biological Opinion.

[2]For purposes of this project, M&I refers to water for industries and cities, as well as for livestock and wildlife uses, recreation, and tourism development.

Insert Map 1 Project Area Map

[Back page of Map 1]

The Settlement Act requires delivery of ALP Project water to the Colorado Ute Tribes by January 1, 2000, to avoid future litigation or renegotiation of Tribal water rights claims. If a project is not approved, or implementation is delayed, the Colorado Ute Tribes have the option of commencing litigation or renegotiating their reserved water rights claims by January 1, 2005.

3.0 PURPOSE OF AND NEED FOR THE PROJECT

The current purpose of and need for the proposed federal action is:

> *... to implement the Settlement Act by providing the Ute Tribes an assured long-term water supply and water acquisition fund in order to satisfy the Tribes senior water rights claims as quantified in the Settlement Act, and to provide for identified M&I water needs in the Project area. [Federal Register Notice, January 4, 1999]*

Providing the Colorado Ute Tribes with an assured long-term water supply is necessary to protect existing water users from senior water right claims. The Colorado Ute Tribes will use this assured water supply to satisfy future M&I water demands on their reservations and to provide water for regional M&I needs. In addition to providing an assured water supply as a settlement of the Colorado Ute Tribes senior water rights, the ALP Project as proposed provides a dependable long-term water supply for neighboring Indian and non-Indian community water needs, including the Navajo Nation at and near Shiprock, New Mexico, the ALPWCD and the SJWC.

4.0 OBJECTIVES OF THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

The DSEIS has been prepared to meet the procedural requirements of NEPA, following the regulations established by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations (CFR) Parts 1500 to 1508) (Regulations). These regulations provide the legal and regulatory guidelines for preparation of environmental impact statements (EIS). The DSEIS incorporates by reference the 1996 FSFES and the 1980 FES to eliminate duplication and repetitive discussions of the same issues, and also incorporates information from the 1996 FSFES and 1980 FES (40 CFR 1508.28 and 1500.4(j)). The purpose of the DSEIS is to supplement the 1996 FSFES and 1980 FES for the ALP Project and provide an environmental evaluation to assist Interior and other involved parties in reaching a final settlement of the water rights claims of the Colorado Ute Tribes.

The Colorado Ute Tribal M&I water uses, which represent about three-quarters of the total water allocations, are currently not specified but have been projected. Non-binding water uses both on and off the Colorado Ute Tribes' reservations were evaluated in order to provide a projection of possible uses and their associated impacts. Projections were made of a range of potential future M&I water uses for ALP Project water as a basis for developing alternatives which would effectively provide water to meet these allocations. The scenarios for future water use were based on reasonable estimates of regional growth and projected needs by the Colorado Ute Tribes, the Navajo Nation, the ALPWCD, and the SJWC within the 57,100 afy depletion limit established under the ESA and the Biological Opinion issued by the Service.

Building on these projected future water uses, as well as analyses that have been done for the 1996 FSFES and the 1980 FES, a broad range of alternatives was developed that focused on a reduced water supply and incorporated both structural and non-structural elements. The DSEIS brings together detailed

information on the Animas River and the San Juan River watershed, including water rights, hydrology, endangered species flows, and overlapping tribal interests. A variety of existing federal storage facilities were evaluated, and new structural and non-structural components were identified. The concept of combining structural and non-structural components to meet ALP Project purpose and needs includes the acquisition of existing direct flow rights from projected willing sellers as well as the restructuring of existing water storage and supply systems for the purpose of meeting additional uses.

5.0 FUTURE WATER USES

The current purpose and need for the proposed ALP Project is to complete implementation of the Settlement Act by providing the Colorado Ute Tribes an assured long-term water supply as specified in the Settlement Act. Providing the Colorado Ute Tribes with an assured long-term water supply is necessary to protect existing water users from senior water right claims by the Colorado Ute Tribes. The Colorado Ute Tribes could use this assured water supply to satisfy any future M&I water demands on their reservations and to provide water for future regional M&I needs. **Table 1** provides a summary of the projected M&I water uses and depletions by the Colorado Ute Tribes and other users.

In addition to providing an assured water supply as a settlement of the Colorado Ute Tribes senior water rights, the ALP Project, as proposed, provides a dependable long-term water supply for neighboring Indian and non-Indian community water needs, including a portion of the Navajo Nation at and near Shiprock, New Mexico, the ALPWCD, and the SJWC. About one-fourth of the ALP Project water would be allocated to the Navajo Nation, the ALPWCD, and the SJWC to serve their identified regional growth and planned M&I needs. The ultimate use of the remaining project water (about three-fourths of the total water supply) by the Colorado Ute Tribes would be more specifically defined by those Tribes as future needs develop. Therefore, a range of potential future water uses was developed. The specific percentage allocation between the Colorado Ute Tribes and other project beneficiaries may not be fixed, however, comments received during scoping, and in recent, introduced legislation by non-federal parties (i.e., HR 3112), indicate that the Colorado Ute Tribes may agree to a reallocation of 6,010 afy to the State of Colorado and entities in New Mexico. A change of that magnitude in the overall allocation of project water may not be significant to the analysis contained herein (other than cost allocation), since a significant amount of the expected use of Tribal water would be for regional water needs (e.g., leasing).

5.1 Colorado Ute Tribal Future Water Uses

The Ute Tribal Water Use Study (Dornbusch 1999) identified several non-binding end uses that could be employed by the Colorado Ute Tribes. This study did not fully allocate all of the Colorado Ute Tribes ALP Project water. Further studies (Riley 1999, Bliesner 1999) projected regional M&I water uses in the event that the Colorado Ute Tribes elect to lease a portion of their ALP Project water to other users. The report by Dornbusch includes examples for the types of water uses listed below. These uses are illustrated on **Map 2**.

- Municipal water use
- Industrial park
- Recreation and tourism development
- Energy development
- Livestock and wildlife water use
- Regional municipal water supply

Table 1
Summary of Future Uses of M&I Water by Colorado Ute Tribes and Other Project Beneficiaries

Category of M&I Use	Diversion (afy)	Depletion (afy)
Non-Binding M&I Use by Southern Ute Indian Tribe		
Florida Mesa Housing	140	70
Animas River Basin Housing	140	70
La Plata River Basin Housing	140	70
Animas Industrial Park	40	20
Ridges Basin Golf Course	796	398
Ridges Basin Resort	44	22
Coal Mine	830	415
Coal-Fired Power Plant	27,000	13,500
Livestock and Wildlife	30	15
Southern Ute Indian Tribe Total	**29,160**	**14,580**
Non-Binding M&I Use by Ute Mountain Ute Tribe		
La Plata Housing	280	140
Mancos Canyon Golf Course	978	489
Mancos Canyon Resort	33	17
La Plata Basin Resort	4,600	2,300
La Plata Basin Golf Course	40	20
La Plata Basin Dude Ranch	30	15
Gas-Fired Power Plant	626	313
Livestock and Wildlife	10	5
Ute Mountain Ute Tribe Total	**6,597**	**3,299**
Non-Binding Regional M&I Water Supply Demand		
Durango, Colorado	15,338	7,669
Bloomfield, New Mexico and Upstream	4,533	2,267
Farmington, New Mexico	28,373	14,187
Florida Mesa, Colorado	7,016	3,508
Red Mesa Plateau, Colorado or Cortez, Colorado	2,105	1,052
Kirtland, New Mexico	7,016	3,508
Aztec, New Mexico	4,911	2,456
Less ALPWCD Allocation	(-5,200)	(-2,600)
Less SJWC Allocation	(-20,800)	(-10,400)
Total Regional Supply	**43,292**	**21,646**
Total Colorado Ute Tribes Settlement	**79,050**	**39,525**

Table 1 (continued)
Summary of Future Uses of M&I Water by Colorado Ute Tribes and Other Project Beneficiaries

Category of M&I Use	Diversion (afy)	Depletion (afy)
Other Binding Uses		
Navajo Nation	4,680	2,340
ALPWCD	5,200	2,600
SJWC	20,800	10,400
Estimated Operational Losses	2,235	2,235
Total for Other Uses	**32,915**	**17,575**
Total Water Use	**111,965**	**57,100[a]**

Source: Dornbusch 1999; Riley 1999; Bliesner 1999.
[a]In addition to the 57,100 afy depletion, the Colorado Ute Tribes are entitled to another 13,000 afy of depletion under the Colorado Ute Indian Water Rights Final Settlement Agreement (Settlement Agreement). These additional depletions could come from the purchase of land and water rights and would follow a historical depletion pattern which would not result in any additional depletions above the 57,100 afy.

5.1.1 Municipal Water Use

Population growth between 1970 and 1990 approached 3 percent per year on both the Southern Ute Indian and Ute Mountain Ute Reservations. However, more recently, the enrollments of both tribes have been increasing approximately 1.3 percent to 1.5 percent per year. The Census Bureau anticipates that Colorado's American Indian population will grow at an average annual rate of 1.9 percent per year through 2025 and then decline to 1.1 percent per year by 2065. Based on these growth rates, the population of the Colorado Ute Tribes is expected to increase from 3,287 in 1998 to approximately 15,000 by the year 2100.

A housing shortage currently exists on both Colorado Ute Tribe reservations. To satisfy the existing housing shortage and to accommodate future growth, the Southern Ute Indian Tribe may choose to locate one 200-housing unit development in each of three areas, for a total of 600 housing units. One would be located near Colorado State Highway 172 on Florida Mesa, one in the La Posta area of the Animas River Basin, and the third in the Red Mesa area of the La Plata River Basin. Correspondingly, the Ute Mountain Ute Tribe may elect to satisfy the demands for housing on its reservation by constructing a 400-housing unit in the southeastern corner of the Colorado portion of the Ute Mountain Ute Reservation.

5.1.2 Industrial Park Water Use

The Southern Ute Indian Reservation lies just south of the City of Durango. The City of Durango is growing and as a result, the demand for industrial park space is increasing. The Southern Ute Indian Tribe owns land in proximity to Durango and may want to lease part of its reservation land for an industrial park. This would require that water be made available.

Map 2 Possible Locations of Colorado Ute Tribe Non-Binding M&I Water End Uses

[back page of Map 2]

5.1.3 Recreation and Tourism Development Water Use

Both Colorado Ute Tribal reservations are located in a scenic area that is a popular tourism destination. The proximity of the Southern Ute Indian Reservation to the City of Durango would allow the reservation to take advantage of the established flow of tourists and help draw visitors to reservation facilities. One possibility would be to construct a resort hotel complex including a golf course and casino.

The Ute Mountain Ute Reservation, although farther from the Durango tourist area than the Southern Ute Indian Reservation, is adjacent to Mesa Verde National Park. This presents an opportunity to establish a Tribal visitor center, with a resort hotel and golf course, to cater to visitors who are drawn by the unique collection of ancient sites in the area. In addition, the Ute Mountain Ute Tribe recently purchased 20,000 acres of land in the La Plata River Basin, providing an opportunity to develop a dude ranch.

5.1.4 Energy Development Water Use

Both reservations lie in the San Juan Basin of southwestern Colorado and northwestern New Mexico. The San Juan Basin contains large coal, oil, and gas reserves and is the location of three operating coal mines and many oil and gas wells. The Southern Ute Indian Reservation is situated over approximately 16 billion tons of Fruitland Formation coal, about 500 million tons of which lie within 500 feet of the surface. The Ute Mountain Ute Reservation overlies Fruitland Formation coal deposits as well. Because of the associated economies of scale, approximately 14.4 million tons of coal offers potential for strip mining if combined with adjacent off-reservation deposits.

The Colorado Ute Tribes' energy resources offer several opportunities for development. Tribal coal could be mined and shipped off the reservations to fuel power plants. Tribal coal and/or gas could be burned in on-reservation power plants, and the electricity generated could be transmitted to the regional power grid. All of these opportunities would require water. Surface mining requires water for dust suppression and land reclamation. Coal or gas-fired power plants typically use water for cooling, as would a coal gasification plant. A coal slurry pipeline would mix pulverized coal with water and pipe the resulting slurry.

5.1.5 Livestock and Wildlife Water Use

Both Colorado Ute Tribal Reservations contain large areas of rangeland, but the use of this rangeland is limited by the scarcity of developed water sources. Livestock operators could make more effective use of the rangeland if additional watering facilities were installed. In addition, using some of their water to help sustain wildlife is important to the Colorado Ute Tribes. The Colorado Ute Tribes would be interested in providing watering facilities for wildlife, especially where pipelines could be tied into the delivery systems established for other uses on the reservations.

5.1.6 Regional Municipal and Industrial Water Supply

Just as the entire West is growing, the San Juan River Basin is experiencing its own population growth. This growth will increase the demand for water, both for household use and for the commercial, industrial, recreational, and community infrastructure needs that accompany population growth.

The Ute Tribal Water Use Study displays how population in the three-county area (La Plata and Montezuma Counties in Colorado and San Juan County in New Mexico) has changed between 1970 and

1998. La Plata County population doubled in that time period, and the population of Montezuma and San Juan Counties has nearly doubled.

5.1.7 In-Stream Leasing

In addition to the above uses of water identified in Dornbusch (1999), the Colorado Ute Tribes could elect to leave project water in one or more of the streams or rivers in the project area, and lease it for enhancement of in-stream values. For example, the Ute Mountain Ute Tribe could elect to negotiate lease terms to release water into the Dolores River to benefit fisheries.

5.2 Future Water Uses of the Navajo Nation, Animas-La Plata Water Conservancy District, and San Juan Water Commission

Based on the Administration Proposal, the Navajo Nation, ALPWCD, and SJWC would annually receive 30,680 af (representing 15,340 afy of depletion) of water from the ALP Project. This represents about one-quarter of the total annual allocations from the ALP Project of 111,965 af (57,100 afy depletion). See Table 1 for a listing of ALPWCD, SJWC, and Navajo Nation future uses.

As shown in Table 1, the Navajo Nation would receive 4,680 afy (2,340 afy depletion) and would use it to serve the M&I requirements of the Shiprock, Cudei, Hogback, Nenahnezad, Upper Fruitland, San Juan, Sanostee, and Beclaibito Chapters in the Shiprock, New Mexico area. A new water pipeline, the Navajo Nation Municipal Pipeline (NNMP), is proposed for construction to deliver this water to these eight Navajo Nation chapters, replacing the existing pipeline between Farmington and Shiprock. The 4,680 afy represents about one-half of the future projected M&I requirements of these chapters, based on a 40-year projection. The NEPA evaluation of the proposed NNMP is included as part of the DSEIS.

The ALPWCD projects growth of M&I water needs in the Durango, Colorado area (Gronning 1994), based on the continued increase in population up to 30,000 to 40,000 people in its service area. Water allocations of 5,200 afy (2,600 afy depletions) from the ALP Project would supplement existing water supplies and would either be diverted from the Animas River upstream of Durango, conveyed from the Florida River Basin, or conveyed from an ALP Project reservoir at Ridges Basin. Improvements to pumping plants and water treatment facilities and development of additional storage have been evaluated and would likely be required. Development of the Horse Gulch Reservoir has been studied by the City of Durango as one specific facility for water storage. Enhancement of water delivery infrastructures would also be required to serve new residential, commercial, and industrial sectors. Future development of facilities to serve the City of Durango and other ALPWCD water users would potentially be the subject of future NEPA compliance if a federal action were involved.

The SJWC has identified water use needs and projected M&I growth in its service area, including the cities of Aztec, Bloomfield, and Farmington, New Mexico (Cielo 1995). Under the ALP Project allocations, the SJWC would receive 20,800 afy (10,400 afy depletion), which would meet a portion of its projected water needs. The SJWC currently has a number of permitted diversions from the San Juan and Animas Rivers to supply its M&I requirements. ALP Project water would be similarly diverted from the Animas and San Juan Rivers, using existing diversion, pumping, and storage facilities. Water could also be stored in the Navajo Reservoir for SJWC uses. Future development of facilities to serve the cities of Aztec, Bloomfield, and Farmington and other SJWC water users would potentially be the subject of future NEPA compliance, if a federal action were involved.

6.0 FUTURE ENVIRONMENTAL COMPLIANCE

The DSEIS addresses the settings, likely impacts, and proposed mitigation measures for structural and non-structural components of alternatives. While these aspects of the proposed structural components are well defined, the non-structural components, as well as future water uses, are projections. The specific uses to which a water acquisition fund may be put by the Colorado Ute Tribes in implementing the non-structural components would be determined in the future. It may include acquisition of land and associated water rights, or other activities appropriate to the use of this fund. The range of impacts would vary depending on these future uses. Similarly, the future water use projections are made for the purpose of comparative NEPA analysis, based on reasonable assumptions at this time. The future water uses described in the DSEIS are non-binding on the Colorado Ute Tribes, and the actual future use of water by them may vary. Any future actions would be subject to future environmental review, and NEPA compliance would be required as part of any approval by a federal agency. In addition, other federal and state regulatory and environmental requirements would have to be met in implementation of future actions (e.g., compliance with the ESA and Clean Water Act (CWA)).

7.0 ALTERNATIVES CONSIDERED

The DSEIS evaluates 10 separate alternatives, including 9 action alternatives that include several structural and non-structural components, and a no action alternative. **Table 2** provides a listing of each alternative and its associated name. The 10 alternatives were evaluated in light of the project purpose and need and their relative environmental impacts. Following the evaluation process, two of the alternatives, Alternatives 4 and 6, were refined and then subjected to a full environmental analysis in the DSEIS. Subsequently, a preferred alternative was identified.

Table 2
List of ALP Project Alternatives

Number	Title
1	Administration Proposal
2	Administration Proposal with Recreation Element Added
3	Administration Proposal with San Juan River Basin Recovery Implementation Program (SJRBRIP) Element Added
4	Administration Proposal with SJRBRIP and Recreation Element Added
5	Animas-La Plata Reconciliation Plan
6	Animas River Citizen s Coalition Conceptual Alternative
7	1996 Final Supplement to the Final Environmental Statement Recommendation Action
8	Administration Proposal with an Alternative Water Supply for Non-Colorado Ute Indian Entities
9	Citizens Progressive Alliance Alternative
10	No Action Alternative

Table 3 presents a summary of the 10 alternatives in terms of water supplied, size of storage facilities required, and whether the alternative is structural or non-structural. This table is provided to assist the reader in gaining a better understanding of the relative differences among these alternatives.

7.1 Structural Components

The DSEIS identifies the storage reservoirs, pumping plant, and conveyance facilities that comprise the ALP Project s structural components. These are defined in detail, their environmental settings and potential environmental impacts are evaluated, and mitigation measures are proposed in the DSEIS for the Preferred Alternative (i.e., Refined Alternative 4), Refined Alternative 6, and the No Action Alternative. The construction and operation of a water pipeline to transmit treated water to the Navajo Nation to areas at and near Shiprock (the NNMP) is also a structural component of the ALP Project.

7.2 Non-Structural Components

The DSEIS considers two scenarios under which a fund would be established for the purchase of water rights and lands within the vicinity of the Colorado Ute Tribe Reservations. One would create a water acquisition fund, which the Colorado Ute Tribes could use over time to acquire water rights on a willing buyer/willing seller basis. The fund would be sufficient to acquire rights for the Colorado Ute Tribes in an amount which provides about 13,000 afy of depletion.

The non-structural component of the Animas River Citizen s Coalition Conceptual Alternative (Alternative 6) also envisions a fund for land and water acquisition which would supply 62,000 afy (53,200 afy depletion) to the Colorado Ute Tribes. A dedicated fund would be created from federal and State of Colorado funds, for use at the sole discretion of the Colorado Ute Tribes to purchase water rights and land from willing sellers over a 30-year period.

The DSEIS inventories the available land and associated water rights in the McElmo Creek and Mancos, La Plata, Animas, Florida, and Pine River drainages in the vicinity of the two reservations. Land values, seniority of water rights, parcel sizes, and other factors were evaluated to develop a realistic picture of the potential acquisition of land and direct flow water rights. Assumptions were made and representative areas were identified in order to develop an analysis of the range of likely non-structural component options that might be made by one or more of the water users in the future. Finally, as part of the non-structural analysis, the potential for securing water supplies from existing Reclamation-owned storage facilities in the region was evaluated. **Map 3** depicts irrigated agricultural lands within the ALP Project area that were evaluated as potentially meeting land and water acquisition targets of non-structural components of several alternatives.

8.0 EVALUATION OF ALTERNATIVES

Building on the identification of a range of future water uses and an evaluation of potential water sources in the region, alternatives were identified that had the ability, in whole or in part, to provide water to the Colorado Ute Tribes in fulfillment of the Settlement Act. These alternatives included the alternatives evaluated in the 1996 FSFES, those identified by Reclamation in the January 1999 Notice of Intent (NOI) published in the *Federal Register*, alternatives suggested during the February 1999 public scoping meetings, and a combination of the structural and non-structural components of all of these alternatives.

Table 3
Summary of Alternatives

Alternative	Reservoir Size (Ridges Basin)	Supplies M&I Water to Colorado Ute Tribes and Navajo Nation	Supplies M&I Water to Non-Indians	Supplies Irrigation Water	Provides Federal Funds to Buy Existing Land and Water Rights	Provides a Revenue Stream to Project Beneficiaries for Undiverted Water	Modify Existing Projects to Provide Water
Alternative 1 Administration Proposal	90,000 af	19,980 afy depletion to each Colorado Ute Tribe and 2,340 afy depletion to Navajo Nation	2,600 afy depletion to ALPWCD and 10,400 afy depletion to SJWC	No	$40 million to the Colorado Ute Tribes	No	No
Alternative 2 Administration Proposal with Recreation Element Added	120,000 af	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1
Alternative 3 Administration Proposal With SJRBRIP Element Added	105,000 af	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1
Alternative 4 Administration Proposal With SJRBRIP Element and Recreation Element Added	135,000 af	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1
Alternative 5 Animas-La Plata Reconciliation Plan	260,000 af	16,525 afy depletion to each Colorado Ute Tribe and 2,340 afy depletion to the Navajo Nation	Same as described under Alternative 1	5,230 afy depletion in Colorado and 780 afy depletion in New Mexico	No	Same as described under Alternative 1	Same as described under Alternative 1
Alternative 6 Animas River Citizen s Coalition Conceptual Alternative	No reservoir	Water from purchase of lands with existing water rights No water for Navajo Nation	Providing water will be responsibility of local entities	Same as described under Alternative 1	$113 to $158 million provided to the Colorado Ute Tribes to purchase existing water rights	Same as described under Alternative 1	Yes. Modification to Pine, Florida, and Dolores Projects
Alternative 7 1996 FSFES Recommended Action	274,000 af	Same as described under Alternative 1	4,600 afy depletion to ALPWCD and 15,400 afy depletion to SJWC	56,100 afy depletion to ALPWCD and 8,800 afy depletion to ALPWCD	No	Same as described under Alternative 1	Same as described under Alternative 1

Table 3 (continued)
Summary of Alternatives

Alternative	Reservoir Size (Ridges Basin)	Supplies M&I Water to Colorado Ute Tribes and Navajo Nation	Supplies M&I Water to Non-Indians	Supplies Irrigation Water	Provides Federal Funds to Buy Existing Land and Water Rights	Provides a Revenue Stream to Project Beneficiaries for Undiverted Water	Modify Existing Projects to Provide Water
Alternative 8 Administration Proposal With an Alternative Water Supply for Non-Colorado Ute Indian Entities	Ridges Basin 75,000 af Aztec 20,000 af	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1	Same as described under Alternative 1
Alternative 9 Citizens Progressive Alliance Alternative	No reservoir	Possibility. Entities must finance development using their revenues. Revenues would be reduced in proportion to amount of water developed.	Possibility. Entities must finance development using their revenues. Revenues would be reduced in proportion to amount of water developed.	Possibility. Entities must finance development using their revenues. Revenues would be reduced in proportion to amount of water developed.	Possibility. Colorado Ute Tribes must finance out of their revenues. Revenues would be reduced in proportion to amount of water developed.	Yes, revenue stream derived from opportunity costs (avoiding costs) from hydropower, salinity control, endangered species, and operation, maintenance, and administrative costs.	Possibility
Alternative10 No Action Alternative	No	No	No	No	No	No	No

Page Holder for Map 3 - Location of Irrigated Agricultural Lands within the ALP Project Area

back page for Map 3

The alternatives and their structural and non-structural components were then evaluated to determine the relative value of each alternative in terms of:

- Potential environmental impacts
- Meeting the ALP Project purpose and need
- Technical and economic merits

8.1 Environmental Evaluation Process

The following resource areas were analyzed in terms of potential environmental impacts associated with the development and construction of the structural and non-structural components of each of the alternatives.

- Agriculture
- Air Quality
- Aquatic (streams)
- Aquatic (reservoirs)
- Archeology
- Cultural and Paleontology
- Ethnography
- Geology and Soils
- Hazardous Materials
- Historical resources
- Land Use
- Limnology
- Noise
- Public Services and Utilities
- Recreation
- Safety
- Socioeconomics
- Threatened/Endangered species
- Transportation
- Vegetation (uplands)
- Visual/Aesthetics
- Wetlands
- Water Quality
- Water Resources/Hydrology
- Wildlife

8.2 Purpose and Need Evaluation

In evaluating whether the ALP Project purpose and need is satisfied by any particular alternative, it is necessary to determine whether it provides a feasible means by which the quantities of water contemplated in the Settlement Agreement can be secured with sufficient certainty. In addition, the

alternative must be reviewed to determine whether it will facilitate overall Settlement implementation. The primary elements necessary to secure an Indian water rights settlement are as follows:

- An agreement by the United States, tribe, state, and a majority of parties to the adjudication, as well as associated legislation, which provides benefits (primarily water rights) to an Indian tribe sufficient to warrant a waiver of the tribe s reserved water rights claims
- A defined and reasonable time frame by which the tribe will, in fact, secure those benefits specified in the Settlement Agreement
- Entry of a final decree by the court adjudicating the water rights claims which recognizes the tribe s right to the water and associated benefits identified in the Settlement Agreement; and
- A waiver of the tribe s water rights claims by both the tribe and the United States in its capacity as trustee, becoming effective. The waiver is contingent upon the three previous elements.

Thus, in considering whether a particular alternative meets purpose and need, the following elements must be evaluated in light of the purpose and need factors which were outlined in the NOI published on January 4, 1999. These factors are described as follows:

- **Water Yield.** Will the alternative annually provide the desired volumes of "wet water" (i.e., water readily available for beneficial use) for the Colorado Ute Tribes to satisfy their reserved rights, as well as provide supply to other identified users? The purpose and need statement describes an intent to implement the 1988 Settlement Act that contemplated an average water supply of 62,200 afy (53,200 afy of depletion) being made available to satisfy the Colorado Ute Tribes' water rights claims in the Animas and La Plata River Basins. Supplying this amount of water is the goal by which each alternative is evaluated. It is recognized, however, that the Colorado Ute Tribes may accept less water as part of a modified settlement in return for other benefits received in such a settlement and the continued support of other water users in the local area. Accordingly, there may be some flexibility in the water yield goal as long as the Colorado Ute Tribes have access to some substantial amount of an assured water supply. Nonetheless, given that the Colorado Ute Tribes flexibility is limited (e.g., Resolution No. 97-160 of the Southern Ute Indian Tribe, and Resolution No. 4365 of the Ute Mountain Ute Tribal Council), an assured water supply commensurate with that contemplated in the 1988 Settlement Act is still the standard for analysis.
- **Reliability.** Will the alternative provide a reliable long-term water supply? Will the yield be renewed by the hydrologic cycle? Reliability is a vital part of providing the Colorado Ute Tribes an assured water supply commensurate with the reserved water rights claims they are relinquishing in the Settlement Act.
- **Location.** Will water supplied by the project be reasonably available to the designated users on their lands and/or communities? Are needed water conveyance facilities feasible for development?
- **Practicability.** Is the development of the alternative technically feasible? Are there impediments or restrictions that make development of the alternative impractical? Some of these perceived impediments may be related to authorization issues or legal processes.

8.3 Technical and Economic Evaluation

The technical and economic merits of each alternative were evaluated in terms of the following categories:

- Feasibility
- Development costs
- Operation, maintenance, and replacement costs
- Public safety
- Impacts to ongoing operations

In addition, preliminary information on Indian Trust Assets (ITAs) was also evaluated. ITAs include the effects on the Colorado Ute Tribes land claims, land rights, water rights, cultural resources on trust lands, mineral rights, and hunting and fishing rights.

An engineering analysis and a cost estimate were prepared for the structural and non-structural components of each alternative. The potential impacts from implementation of the non-structural components of alternatives were also analyzed as a means to identify potentially available water. This included an analysis of water conservation on the Pine, Florida, and Dolores Rivers. The analysis also included an evaluation of water rights and a determination of agricultural and land values that would bear on the acquisition of land and water rights to fulfill a portion of the Settlement Act water needs.

8.4 Summary of the Strengths and Weaknesses of Each Alternative

8.4.1 Alternative 1 - Administration Proposal

Areas of Strengths

- Meets purpose and need of the project
- Satisfies Colorado Ute Tribes ITAs by providing water and other benefits commensurate with the 1988 Settlement Act
- Provides M&I water to ALPWCD, SJWC, and Navajo Nation
- Provides for a long-term assured water supply

Areas of Weakness

- Loss of 121 acres of wetlands in Ridges Basin
- Does not provide water for a conservation pool
- Loss of 1,280 acres of wildlife habitat

- Potential impact to 380 cultural resource sites
- More difficult for Jicarilla Apache Tribe and the Navajo Nation to develop water rights on the San Juan River
- Does not provide sufficient water to meet flow requirements pursuant to the ESA

8.4.2 Alternative 2 - Administration Proposal with Recreation Element Added

Areas of Strengths

- Meets the purpose and need of the project
- Satisfies Colorado Ute Tribes ITAs by providing water and other benefits commensurate with the 1988 Settlement Act
- Provides a reservoir conservation pool; recreation potential
- Provides M&I water to ALPWCD, SJWC, and Navajo Nation
- Provides for a long-term assured water supply

Areas of Weakness

- Does not provide sufficient water to meet flow recommendations in the San Juan Basin pursuant to the ESA
- Loss of 120 acres of wetlands in Ridges Basin
- Loss of 1,490 acres of wildlife habitat
- Potential impacts to 380 cultural resource sites
- More difficult for Jicarilla Apache Tribe and the Navajo Nation to develop water rights on the San Juan River

8.4.3 Alternative 3 - Administration Proposal with San Juan River Basin Recovery Implementation Program Element Added

Areas of Strengths

- Meets the purpose and need of the project
- Satisfies Colorado Ute Tribes ITAs by providing water and other benefits

commensurate with the 1988 Settlement Act

- Provides sufficient water to meet flow recommendations in the San Juan Basin pursuant to the ESA
- Provides water to ALPWCD, SJWC, and Navajo Nation
- Provides for a long-term assured water supply

Areas of Weakness

- Does not provide for a conservation pool
- Loss of 121 acres of wetlands at Ridges Basin
- Loss of 1,370 acres of wildlife habitat
- Potential impacts to 380 cultural resource sites
- More difficult for Jicarilla Apache Tribe and the Navajo Nation to develop water rights on the San Juan River

8.4.4 Alternative 4 - Administration Proposal with San Juan River Basin Recovery Implementation Program and Recreation Element Added

Areas of Strengths

- Meets the purpose and need of the project
- Satisfies Colorado Ute Tribes ITAs by providing water and other benefits commensurate with the 1988 Settlement Act
- Provides for a conservation pool in Ridges Basin; recreation potential
- Provides sufficient water to meet flow recommendations in the San Juan Basin pursuant to the ESA
- Provides M&I water for the ALPWCD, SJWC, and Navajo Nation
- Provides for a long-term assured water supply
- Allows for some development of water by Jicarilla Apache Tribe and the Navajo Nation on the San Juan River

Areas of Weakness

- Loss of 134 acres of wetland habitat
- Loss of 1,570 of wildlife habitat in Ridges Basin Reservoir
- Potential impact to 430 cultural resource sites

8.4.5 Alternative 5 - Animas-La Plata Reconciliation Plan

Areas of Strengths

- Would meet the water needs of the ALPWCD, SJWC, and Navajo Nation
- Plan is acceptable to the Colorado Ute Tribes as a final settlement of their water rights claims
- Eliminates water quality concerns according to the New Mexico Department of Environment

Areas of Weakness

- Loss of 121 acres of wetlands in Ridges Basin
- Loss of 2,190 acres of wildlife habitat
- Potential impacts to 200 cultural resource sites
- Conservation pool

8.4.6 Alternative 6 - Animas River Citizen s Coalition Conceptual Alternative

Areas of Strengths

- Leaving water on the land for farming would result in minimal damage to the environment
- Has potential if modified in an attempt to meet the purpose and need for the project
- Has potential if the significant loss of wetlands could be avoided

Areas of Weakness

- Has a fatal flaw in that it does not truly meet purpose and need of the project because it does not supply water to ALPWCD, SJWC, and Navajo Nation

- Satisfying the water yield for the Colorado Ute Tribes is uncertain due to the difficulty of implementation of a water rights purchase program
- Likelihood of opposition from local farming community
- Component of leaving water on the land was not defined by the Colorado Ute Tribes as a potential future water use
- Purchase of land and water rights and removing water from the land for M&I use could result in loss of several thousand acres of wetland habitat
- Water conservation component of irrigation systems improvement would also result in large losses of wetland habitat
- Allows for no future development of water by the Jicarilla Apache Tribe and the Navajo Nation from the San Juan River.

8.4.7 Alternative 7 - 1996 Final Supplement to the Final Environmental Statement Recommended Action

Areas of Strengths

- Meets purpose need of the project
- Provides M&I industrial water to rural areas in Colorado (i.e., La Plata River areas)
- Irrigation water would be provided to the Colorado Ute Tribes as per the Settlement Agreement and the Settlement Act
- Construction of two reservoirs would provide water storage and a conservation pool (Ridges Basin and Southern Ute Reservoirs)

Areas of Weakness

- Loss of 435 acres of wetlands in Ridges Basin and from canal abandonment
- Total water depletion of 149,220 afy which is in excess of 57,100 afy depletion
- Constructed in two phases (A and B)
- Loss of 2,270 acres of elk habitat
- Potential impacts to 1,600 cultural resource sites
- Water quality problems associated with irrigation practices and return flows

- Does not provide sufficient water to meet the flow recommendations in the San Juan Basin pursuant to the ESA

8.4.8 Alternative 8 - Administration Proposal with an Alternative Water Supply for Non-Colorado Ute Indian Entities

Areas of Strengths

- Satisfies Colorado Ute Tribes ITAs by providing water and other benefits commensurate with the 1988 Settlement Act

Areas of Weakness

- Cost of constructing two dams would be more expensive than a single dam at Ridges Basin
- Existing gas wells within boundaries of the proposed Aztec Reservoir would present significant problems
- Geologic concerns related to the potential of falling rim rock within the Aztec Reservoir Basin
- Purchase of land and water rights to satisfy the non-structural component would require the purchase of 55 percent of the non-Indian irrigated lands in the Animas/San Juan River Basin in New Mexico

8.4.9 Alternative 9 - Citizens Progressive Alliance Alternative

Areas of Strengths

- Has some merit if some components of Alternative 9 are combined with other alternatives

Areas of Weakness

- Has a fatal flaw in that it does not meet the purpose and need of the project and to supply water to ALPWCD, SJWC, and Navajo Nation
- There is also difficulty in ensuring benefits of the instream flow that would be preserved by Alternative 9
- There is a practicability problem associated with implementation of Alternative 9

8.4.10 Alternative 10 - No Action Alternative

Areas of Strengths

- No cost would be incurred by the federal government with the exception of costs involved in possible litigation and settlement of the two Colorado Ute Tribes water rights claims
- In the short-term, would not impact development in the San Juan Basin by the Jicarilla Apache Tribe and the Navajo Nation
- In the short-term, would not affect any existing wetlands

Areas of Weakness

- Has a fatal flaw in that it does not meet the purpose and need of the project
- Would not supply water to satisfy the projected water needs of the ALPWCD, SJWC, and Navajo Nation
- Water development in the future could take place on a piecemeal, inefficient basis

8.5 Summary of Alternatives Evaluation and Selection of Alternatives for Further Refinement and Study

An evaluation of the alternatives for potential environmental impacts, fulfillment of project purpose and need, and relative technical and economic merits is summarized in the three tables in this section. In addition, two alternatives, Alternative 4 and Alternative 6, were selected for further refinement and study.

8.5.1 Environmental Impact Summary

A comparison was made of the alternatives and their potential environmental impacts (see **Table 4**). Implementation of Alternative 6, wherein water rights would be purchased and the water would be left on the land would present the least overall impact of the 10 alternatives. Alternative 9 was the next most environmentally desirable alternative, followed by Alternatives 5, 4, 3, and 8. Alternatives 1 and 2 would not meet the flow recommendations of the SJRBRIP and would present significant environmental impacts. Alternative 7 had significant water quality and socioeconomic impacts.

Table 4
Summary of Significant Environmental Impacts of the Alternatives

Alternative	Summary of the More Significant Impact Areas	Overall Environmental Rating of Alternative
Alternative 1 Administration Proposal	Would impact meeting the flow recommendations of the SJRBRIP. Approximately 134 acres of wetland loss in Ridges Basin. Potential for slight negative impact on rafting and fishing on the Animas River. Potential to affect 380 cultural resources sites. The size of Ridges Basin would only support a put and take fishery (no conservation pool). Water quality in the Animas River would be degraded by 2% to 4% over historical values. About 1,280 acres of potential wildlife habitat would be inundated by Ridges Basin Reservoir.	No significant environmental obstacles except not being able to meet flow recommendations of the SJRBRIP, which is significant.
Alternative 2 Administration Proposal With Recreation Element Added	Would impact meeting the flow recommendations of the SJRBRIP. Approximately 134 acres of wetland loss in Ridges Basin. Potential for slight negative impact on recreational rafting and fishing on the Animas River. Potential to affect approximately 380 cultural resource sites. A conservation pool would be provided for in Ridges Basin Reservoir to help maintain reservoir water quality and provide capacity for a cold water fishery that could be established. About 1,490 acres of potential wildlife habitat would be inundated by Ridges Basin Reservoir.	Same as above for Alternative 1.
Alternative 3 Administration Proposal With SJRBRIP Element Added	Would not impact meeting the flow recommendations of the SJRBRIP. Approximately 134 acres of wetland loss in Ridges Basin. Potential for slight negative impact on recreational rafting and fishing on the Animas River. Potential to affect approximately 380 cultural resource sites. The size of Ridges Basin Reservoir would only support a put and take fishery (no conservation pool). About 1,370 acres of potential wildlife habitat would be inundated by Ridges Basin Reservoir.	Environmentally superior to Alternatives 1 and 2. Meets the SJRBRIP flow recommendations. No significant environmental flaws.
Alternative 4 Administration Proposal with SJRBRIP and Recreation Element Added	Would not impact meeting flow recommendations of the SJRBRIP. Positive effect of recreational opportunities at Ridges Basin. Approximately 134 acres of wetland loss in Ridges Basin. Potential for slight negative impact on recreational rafting and fishing on the Animas River. Potential to affect approximately 430 cultural resource sites. Ridges Basin Reservoir would be large enough to support a trout reproductive fishery, and conservation pool will help maintain reservoir water quality. About 1,570 acres of potential wildlife habitat would be inundated by Ridges Basin Reservoir.	Environmentally superior to Alternatives 1, 2, and 3. Meets the SJRBRIP flow recommendations. No significant environmental flaws.
Alternative 5 Animas-La Plata Reconciliation Plan	Would not impact meeting flow recommendations of SJRBRIP. Reservoir also large enough for a recreational component. Loss of 134 acres of wetland in Ridges Basin. About 200 cultural resources sites would be affected. Pumping may have a slight negative impact on recreational rafting and fishing on the Animas River. Ridges Basin Reservoir would provide for boating and fishing opportunities on the Reservoir. About 2,190 acres of potential wildlife habitat would be inundated by Ridges Basin Reservoir.	No significant environmental flaws but more impactive than Alternatives 1, 2, 3, and 4.

Table 4 (continued)
Summary of Significant Environmental Impacts of the Alternatives

Alternative	Summary of the More Significant Impact Areas	Overall Environmental Rating of Alternative
Alternative 6 Animas River Citizens Coalition Conceptual Alternative	There are several components to this alternative. The component of purchasing land and water rights and leaving the water on the land is the least environmentally damaging of the components. The component of purchasing the water and transferring the use of the water to M&I use would result in a loss of 1,400 acres of wetlands. The most environmentally damaging component is implementing water conservation measures through converting from flood to sprinkler systems. An estimate of 6,000 to 8,000 acres of wetlands would be lost through this component. Would not impact meeting flow recommendations of the SJRBRIP.	If the land and water rights are purchased and the water is left on the land, this alternative is the most environmentally preferred. If the water is removed from the land, or water is obtained through conservation measures, this alternative is the least environmentally preferred.
Alternative 7 1996 FSFES Recommended Action	There were significant water quality concerns and socioeconomic issues as described in the 1996 FSFES. Phase I, Stage A would cause little impact to the recreation and water quality in the Animas River. Phase I, Stage B and Phase II would cause a more significant impact to recreation and water quality on and in the Animas River. Also, irrigation return flows would have a negative impact on water quality. About 3,500 cultural resources sites could be affected. Phase I, Stage A would meet flow recommendations but Phase I, Stage B and Phase II would impact meeting flow recommendations of the SJRBRIP. Approximately 2,190 acres of potential wildlife habitat would be inundated by Ridges Basin Reservoir.	Received a low environmental rating because of water quality concerns. Also, not as attractive as other alternatives in meeting the flow recommendations of the SJRBRIP.
Alternative 8 Administration Proposal with an Alternative Water Supply for Non-Colorado Ute Indian Entities	Would impact meeting the flow recommendations of the SJRBRIP. Approximately 134 acres of wetland loss in Ridges Basin. Potential for slight negative impact on rafting and fishing on the Animas River. There are water quality issues associated with a smaller reservoir at Ridges Basin. Potential to affect 380 cultural resources sites in Ridges Basin and additional sites in the Aztec Reservoir site. The loss of wildlife habitat would be similar to Alternatives 1 and 3.	Not as desirable as other alternatives with Ridges Basin because of poorer water quality. Would have the impacts associated with building two reservoirs.
Alternative 9 Citizens Progressive Alliance Alternative	There appears to be little impact to the environment and the impacts with the other alternatives would be avoided if this alternative was implemented.	Next to Alternative 6, using the option where water is bought and left on the land, this alternative is the next most environmentally preferred alternative.
Alternative 10 No Action Alternative	There would be no immediate change in the environment over present day conditions. Legal actions that may be taken by the Colorado Ute Tribes could result in significant issues.	(No rating)

8.5.2 Purpose and Need Summary

A matrix of relative values was used as the basis for evaluating the likely ability of each alternative to satisfy the elements of an Indian water rights settlement for the Colorado Ute Tribes and therefore meet the purpose and need. **Table 5** contains the summary results of evaluating each of the alternatives against requirements of satisfying the elements of an Indian water rights settlement. In this process, potential combinations of structural and non-structural components were made which identified refinements to the alternatives as originally proposed. Although Alternative 6 presented significant problems from its ability to meet all the elements of an Indian water rights settlement, it has been refined in order to provide this alternative the best possible chance of meeting these elements. Alternative 4 was the other alternative chosen to be refined in light of ESA and CWA concerns.

8.5.3 Technical and Economic Summary

Table 6 contains a summary of the technical and economic evaluation of each alternative. The potential impacts to ITAs ranged from significantly negative through no impacts to overall positive impacts. Alternatives 9 and 10 were rated the lowest because neither would provide water to meet the ITAs and therefore would not satisfy the ITAs for the Colorado Ute Tribes. Alternative 6 would result in positive economic impacts from the acquisition of lands and water by the Colorado Ute Tribes, while Alternatives 1, 2, 3, 4, 5, 7, and 8 would result in negative impacts from construction. There were no significant differences between Alternatives 1, 2, 3, 4, 5, 7, and 8 for feasibility. For impacts to ongoing operations, Alternatives 1, 2, 3, 4, 5, 7 and 8 would have only minor impacts. Impacts to public safety ranged from negative (Alternatives 1, 2, 3, 4, and 8) to positive (Alternative 6) based on the relative potential for dam failure.

8.6 Selection of Alternatives for Further Study

Based on the strengths and weaknesses of the alternatives described and the analysis of alternatives based on environmental impacts, purpose and need, and technical and economic factors in this section, Alternative 4 and Alternative 6 warranted further refinement. These alternatives were close in their overall comparison of environmental effects and each represent a significantly different approach in meeting the purpose and need of the project. Alternative 4 is primarily structural, and Alternative 6 is primarily non-structural. Before completing additional studies on Alternative 4 and Alternative 6, refinements to both alternatives were made. The important components of these refinements are described below.

- NNMP was added as a component to both refined alternatives. A discussion on alternatives for the NNMP are discussed under Refined Alternative 4.

- For Refined Alternative 4, the amount of funds available to purchase 13,000 afy of water rights would be limited to $40 million dollars. This is the cost for the purchase of 13,000 afy if it could be accomplished in one year. Lands purchased over time would likely result in a higher cost.

- In Refined Alternative 4 and Refined Alternative 6, the water rights purchased for the 13,000 afy would be left on the land for continual agricultural use. Leaving water on the land in Refined Alternative 4 and Refined Alternative 6 would result in virtually no environmental impacts.

Table 5
Summary of the Capability of Alternatives to Meet the Purpose and Need Requirements

Alternative	Purpose and Need Requirement Areas				Overall Summary of Purpose and Need
	Water Yield[a]	Reliability	Location	Practicability	
Alternative 1 Administration Proposal	Provides desired yield of 57,100 afy depletion for structural component and approximately 13,000 afy depletion from the non-structural component.	Water supplies are renewed through the hydrologic cycle.	Ridges Basin is located in close proximity to many M&I needs. Some needs are located further than desired. Would receive a moderate to high rating for location.	It is practicable to construct Ridges Basin Dam. Alternative would impact meeting flow recommendations for the SJRBRIP which would result in a low rating for practicability.	Alternative 1 is acceptable in that it meets the purpose and needs requirement although it does impact meeting the flow recommendations for the SJRBRIP.
Alternative 2 Administration Proposal With Recreation Element Added	Same as described under Alternative 1.	Same as described under Alternative 1.	Same as described under Alternative 1.	Same as described under Alternative 1.	Same as described under Alternative 1.
Alternative 3 Administration Proposal With SJRBRIP Element Added	Same as described under Alternative 1.	Same as described under Alternative 1.	Same as described under Alternative 1.	It is practicable to construct Ridges Basin Dam. Does not impact meeting flow recommendations for the SJRBRIP, which would result in a high rating for practicability for Alternative 3.	Alternative 3 is acceptable in that it meets the purpose and need requirements. It is favored over Alternatives 1 and 2 in that it meets the requirements for endangered fish in the San Juan River.
Alternative 4 Administration Proposal with SJRBRIP and Recreation Element Added	Same as described under Alternative 1.	Same as described under Alternative 1.	Same as described under Alternative 1.	Same as described under Alternative 3.	Alternative 4 is acceptable in that it meets the purpose and need requirements. It is favored over Alternative 3 in that it meets the requirements for endangered fish in the San Juan River and has a conservation pool.
Alternative 5 Animas-La Plata Reconciliation Plan	Does not supply all the water to satisfy 62,200 afy diversions (or 53,200 afy of depletion) to Colorado Ute Tribes, therefore it does not pass the test for water yield.	Same as described under Alternative 1.	Same as described under Alternative 1.	It is practicable to construct Ridges Basin Dam. The plan can be implemented but it does not satisfy the 1988 Settlement Act.	Rated low because it does not provide the required water supply under the Settlement Act.

[a] In addition to the 57,100 afy of depletion associated with the structural components of Alternatives 1, 2, 3, 4, and 8, the Colorado Ute Tribes are entitled to an additional 13,000 afy of depletion under the Settlement Agreement. This additional depletion could come from the acquisition of existing water rights through the purchase of irrigated agricultural lands and would follow an historic depletion pattern that would not result in a total ALP Project depletion above the 57,100 afy.

Table 5 (continued)
Summary of the Capability of Alternatives to Meet the Purpose and Need Requirements

Alternative	Purpose and Need Requirement Areas				Overall Summary of Purpose and Need
	Water Yield	Reliability	Location	Practicability	
Alternative 6 Animas River Citizen s Coalition Conceptual Alternative	The purchase of lands and water and leaving the water on the land or using it for M&I purposes meets the desired water yield of 62,200 afy diversion (or 53,200 afy depletion) for the Colorado Ute Tribes. The use of water from federal facilities does not supply the required water yield. Does not provide water for non-Colorado Ute Tribe entities and would rate low in terms of water yield.	The water supply would be renewed on an annual basis for either farming or for M&I purposes. Does not provide water on a renewable basis for non-Colorado Ute Tribe entities. The use of water from federal facilities does not provide for a renewed water supply each year.	Would rate high in location because the water sources are located closer to the potential M&I use areas.	Alternative 6 would rate low in practicability because of the need to purchase approximately 27% of the total non-Indian irrigated lands in the project area. Also, if the land is purchased and water moved off the land and used for M&I purposes, the amount of wetland mitigation would make this alternative impracticable.	Alternative 6 was rated as low to moderate because of the lack of practicability and acceptability of purchasing water rights for lands in excess of 43,000 acres, which represents about 27% of the non-Indian irrigated lands in La Plata and Montezuma Counties. The availability of water from federal project received a very low rating. Also, does not provide water for non-Colorado Ute Tribe entities as required under the purpose and need of the project. The practicability of mitigating for the loss of a large amount of wetlands is also questionable.
Alternative 7 1996 FSFES Recommended Action	Phase I only provides 32,500 afy for the Colorado Ute Tribes which is considerably less than the diversion of 62,200 afy required under the Settlement Act. Phase II, combined with Phase I, would provide the required water under the Settlement Act.	Same as described under Alternative 1.	Ridges Basin Dam and other associated facilities are located in close proximity to the needs of the Colorado Ute Tribes.	Alternative 7 is practicable in that the project could be implemented and meets the Settlement Act total water needs, if irrigation were an acceptable component. Alternative would impact meeting flow recommendations for the SJRBRIP which would result in a low practicability rating.	Alternative 7 does not strictly meet the purpose and need in that it has an agricultural component. It received a low rating in terms of meeting the purpose and need factors.

Table 5 (continued)
Summary of the Capability of Alternatives to Meet the Purpose and Need Requirements

Alternative	Purpose and Need Requirement Areas				Overall Summary of Purpose and Need
	Water Yield	Reliability	Location	Practicability	
Alternative 8 Administration Proposal with an Alternative Water Supply for Non-Colorado Ute Indian Entities	Same as described under Alternative 1.	Same as described under Alternative 1.	Ridges Basin and the Aztec Reservoir site are located in close proximity to many M&I needs. Some needs are located further than desired. Alternative would receive a moderate to high rating for location.	The structural components of Alternative 8 are practicable. The non-structural component of purchasing existing water rights and agricultural lands in New Mexico is not practical from cost and acceptability standpoints.	Alternative 8 was rated as being able to meet the purpose and need, but is not as desirable as Alternative 4.
Alternative 9 Citizens Progressive Alliance Alternative	Does not provide the desired water yield. It is based on revenue streams from opportunity costs.	Does not have a means to ensure that the water supply would be available on a renewable basis. To carry out this alternative, there would need to be storage provided.	Alternative does not provide for water in the locations where the Colorado Ute Tribes have identified their water needs. It does, however, provide that monies from the revenue streams could be used to construct facilities to serve these areas.	Alternative 9 is not practicable in that it would be difficult to implement. It assumes that storage would be available somewhere on the Colorado River, system such as at Glen Canyon.	Overall, Alternative 9 does not meet the purpose and need. It does not provide for the required water supply for the Settlement Act.
Alternative 10 No Action Alternative	Does not provide any water and, therefore, does not pass the test of water yield.	Does not provide water on a renewable basis.	No rating on location.	Litigation could occur if this course were pursued.	No Action does not meet the purpose and need of the project.

Table 6
Summary of Technical and Economic Factors

Alternative	Technical and Economic Areas						Overall Evaluation
	Indian Trust Assets	Feasibility	Development Costs	Annual O&M and Replacement Costs	Public Safety	Impacts to Ongoing Operations	
Alternative 1 Administration Proposal	Satisfies water claims as quantified in the Settlement Act. Development would make it more difficult for Jicarilla Apache Tribe and Navajo Nation to develop more water from the San Juan River.	It is technically feasible to construct Ridges Basin. Dam.	$217 million	$1.6 million	A safe dam at Ridges Basin could be constructed.	Flow recom-mendations for endangered fish could be met.	Satisfies the technical and economic factors.
Alternative 2 Administration Proposal with Recreation Element Added	Same as described under Alternative 1.	Same as described under Alternative 1.	$239 million	Same as described under Alternative 1.	Same as described under Alternative 1.	Same as described under Alternative 1.	Same as described under Alternative 1.
Alternative 3 Administration Proposal with SJRBRIP Element Added	Same as described under Alternative 1.	Same as described under Alternative 1.	$224 million	Same as described under Alternative 1.	Same as described under Alternative 1.	Same as described under Alternative 1.	Satisfies the technical and economic factors. Because of ESA, it is more attractive than Alternatives 1 and 2.
Alternative 4 Administration Proposal with SJRBRIP and Recreation Element Added	Same as described under Alternative 1.	Same as described under Alternative 1.	$247 million	$1.5 million	Same as described under Alternative 1.	Same as described under Alternative 1.	Same as described under Alternative 3.
Alternative 5 Animas-La Plata Reconciliation Plan	Colorado Ute Tribes agreed to settle for the amount of water identified in this alternative.	Same as described under Alternative 1.	$238 million	Same as described under Alternative 1.	Same as described under Alternative 1.	There would be no impacts to ongoing operations.	Does satisfy Colorado Ute Tribes ITAs.

Table 6 (continued)
Summary of Technical and Economic Factors

Alternative	Technical and Economic Areas						Overall Evaluation
	Indian Trust Assets	Feasibility	Development Costs	Annual O&M and Replacement Costs	Public Safety	Impacts to Ongoing Operations	
Alternative 6 Animas River Citizen s Coalition Conceptual Alternative	The purchase of land and water rights and transferring to M&I users would meet ITAs. The purchase of land and water rights and leaving water on the land for agricultural use would not meet the ITAs since the purpose and need is for M&I water. The component of obtaining water from use of existing facilities would not provide the required water to satisfy ITAs. Under this latter component, only 20,000 afy of water would be available.. Uncertainties as to whether sufficient benefits with sufficient certainty are provided to justify Tribes waiving their claims.	The feasibility of purchasing in excess of 43,000 acres of land is feasible but receives a low rating in feasibility because of the difficulty in implementation and acceptability by the Colorado Ute Tribes and non-Indian farmers.	Scenario 1 - Purchase water rights and farm Cost=$220 million Scenario 2 - Purchase water rights and transfer to M&I use Water rights/lands = $260 million Required storage= $80 million Total cost = $340 million Scenario 3 - Use of water from federal facilities Improve irrigation systems: Cost=$392 million Raise Lemon Dam Cost=$28 million Total=$430 million	Scenario 1 - O&M = $64,500/year Scenario 2 - Costs are dependent on location, type of facilities, and water use. Scenario 3 - O&M = $87,500/year Replacement for sprinklers = $1.4 million per year when annualized over 50 years	Scenario 1 - No impact on public safety. Scenario 2 - Overall, no to low impact with the con-struction of new storage facilities. Scenario 3 - Enlarging Lemon Dam would provide a positive increase in safety.	Would have impacts to the agricultural economy in La Plata and Montezuma Counties. A significant number of non-Indian farmers would be displaced through the purchase of more than 43,000 acres of existing non- Indian farms. Would have potential negative effect to endangered southwestern willow flycatcher	Overall, this alternative received a low to moderate rating based on technical and economic factors. Among the reasons for this rating is the practicability and acceptability of purchasing 27% of the non-Indian irrigated lands in La Plata and Montezuma Counties.
Alternative 7 1996 FSFES Recommended Action	Together, Stage A and B of Phase I would meet ITAs.	Is feasible in that the project could be constructed.	$246 million	$3.8 million	Same as described under Alternative 1.	Same as described under Alternative 5.	Same as described under Alternative 1.

Table 6 (continued)
Summary of Technical and Economic Factors

Alternative	Technical and Economic Areas						Overall Evaluation
	Indian Trust Assets	Feasibility	Development Costs	Annual O&M and Replacement Costs	Public Safety	Impacts to Ongoing Operations	
Alternative 8 Administration Proposal With an Alternative Water Supply for Non-Colorado Ute Indian Entities	Satisfies ITAs by providing required M&I water.	Ridges Basin and Aztec Reservoirs are feasible to construct. Implementing a water rights purchase program in New Mexico would be expensive and difficult to carry out.	Ridges Basin = $154 million To Ridges Basin would be added the cost of one of the following options: (1) Aztec Reservoir = $84 million or (2) Purchase water rights and land = $206 million	Approximately $1.6 million with either option of Aztec Reservoir or purchasing water rights.	There would be no impacts to public safety.	Same as described under Alternative 5.	Overall, it meets the criteria under technical and economic factors.
Alternative 9 Citizens Progressive Alliance Alternative	Does not satisfy ITAs because it would not provide the required M&I water.	The idea of "opportunity costs" would be very difficult to implement.	There would be no cost involved with this alternative.	Not computed .	Same as described under Alternative 1.	Same as described under Alternative 5.	Would not satisfy ITAs and rates low according to feasibility and practicability.
Alternative 10 No Action Alternative	Same as described under Alternative 9.	It is not practicable to follow a course of no action.	The cost of following a course of no action cannot be quantified, but the costs could be significant.	There would be no OM&R costs associated with no action	Same as described under Alternative 1.	If the Tribes followed a course of litigation, it could have serious impacts on the water rights in southwest Colorado.	No action is not a desirable course to follow. It does not satisfy the ITAs and costs to ongoing operations could be significant.

- For the portion of Alternative 6 which requires that water be removed from the land to meet M&I purposes, it was assumed that a plan could be developed that would avoid impacts to the environment. It was assumed that 50 percent of the potential loss of wetlands could be avoided in this manner.

- Refined Alternative 6 would be designed to make it commensurate to Refined Alternative 4 in terms of meeting the purpose and need of the project. One component of Refined Alternative 6 would be similar to the structural component of Refined Alternative 4 in terms of developing a water supply with a depletion of up to 57,100 afy. A second component of Refined Alternative 6 would purchase lands and water rights to yield approximately 13,000 afy of depletions.

- To minimize the purchase of lands, efforts are made to evaluate the potential for the coordinated operation of reservoirs and streamflows in the project area to make more efficient use of water supplies.

9.0 DESCRIPTION OF ALTERNATIVES SELECTED FOR FURTHER REFINEMENT

The Plan of Approach envisioned refining the design of structures and/or developing an implementation plan for water rights purchase to sufficient detail to support project authorization and funding. This level of effort provides a high confidence in cost estimates and technical viability of structural features and displays the risks associated with a water rights purchase plan.

Two alternatives that were evaluated warranted refinement due to the closeness in their overall comparison of environmental effects and because they each represent a significantly different approach in meeting the purpose and need of the ALP Project (i.e., Refined Alternative 4 is principally a structural alternative and Refined Alternative 6 is principally a non-structural alternative). There are concerns over the ability of Alternative 6 to meet the project purpose and need. In refining Alternative 6, an attempt was made to address these concerns.

9.1 Refined Alternative 4

Refined Alternative 4 includes both structural and non-structural elements designed to achieve the fundamental purpose of securing the Colorado Ute Tribes an assured water supply in satisfaction of their water rights as determined by the 1986 Settlement Agreement and the 1988 Settlement Act and by providing for identified M&I water needs in the project area. All structural facilities would be designed to deplete no more than an average of 57,100 afy. This depletion limit is consistent with the 1996 Biological Opinion issued by the Service.

Depletion of water from the structural portion of the project would be restricted to M&I uses only and would be allocated as shown below:

- Southern Ute Indian Tribe 19,980 afy depletion
- Ute Mountain Ute Tribe 19,980 afy depletion
- Navajo Nation 2,340 afy depletion
- ALPWCD 2,600 afy depletion
- SJWC 10,400 afy depletion

Under this allocation, the Colorado Ute Tribes would still be approximately 13,000 af short of the total quantity of depletion recognized in the Settlement Agreement. Therefore, the non-structural component of the project would establish and utilize a water acquisition fund which the Colorado Ute Tribes could use over time to acquire water rights on a willing buyer/willing seller basis in an amount sufficient to allow the Tribes to purchase approximately 13,000 afy of historical depletions in addition to the depletions available from the structural portion of the project. A one-time fund of approximately $40 million has been established to purchase the additional rights. However, to provide flexibility in the use of the fund, authorization would allow some or all of the funds to be redirected for on-farm development, water delivery infrastructure, and other economic development activities.

The primary source of the water for the structural portion of Refined Alternative 4 is the Animas River. The project water requirements would be met from the water supply after meeting all current uses, all uses that could occur without further federal action (primarily exercise of state water rights not presently being used as identified by Colorado and New Mexico), and all uses for which favorable biological opinions have been issued.

The water supply for the non-structural component would include the Pine, Florida, Animas, La Plata and Mancos Rivers. The supply would be developed from existing uses within each basin, with the associated historic shortages and depletions, so no additional water would be needed to meet the demands of the non-structural components.

9.1.1 Structural Components of Refined Alternative 4

The structural components and associated features of Refined Alternative 4 are shown on **Map 4** and include:

- Durango Pumping Plant and Ridges Basin Inlet Conduit
- Ridges Basin Dam and Reservoir
- Navajo Nation Municipal Pipeline
- Electrical Transmission Lines
- Ridges Basin Recreational Element by a Non-Federal Entity

Durango Pumping Plant - The pumping plant would pump water from the Animas River and lift it through the Ridges Basin Inlet Conduit into Ridges Basin Reservoir. The pumping plant would be located on the west side of the river across from Santa Rita Park located on the south side of downtown Durango, Colorado. Access to the pumping plant would be from County Road (CR) 211 immediately north of Centennial Mall. On site with the pumping plant would be the intake structure, a parking area, a surge chamber, and an electrical switchyard. The intake structure would conduct water from the river through control gates and to the fish screen, then into a covered basin that serves as a forebay for the pumping plant. The entrance to the intake structure would consist of a sloping grate 48 feet long, situated to conform to the riverbank and designed to exclude the entry of debris into the control gates. The fish screen, 80 feet back from the river, would be designed to keep fish greater than two inches long from passing, and all fish would be channeled back to the river by the velocity in a bypass pipe at the base of the screen. The intake structure would be covered except for the fish screen area that would be open to facilitate cleaning and maintenance.

Map 4 **Structural Components of Refined Alternative 4**

backpage for Map 4

The pumping plant would be placed about 160 feet back from the river and would be both lower and not as long as the structure described in the 1996 FSFES. The lower flow requirement of 280 cubic feet per second (cfs) facilitates the application of single stage horizontal centrifugal pumps instead of the higher-capacity vertical spiral case pumps proposed previously. The single stage horizontal pumps are similar in silt handling capability, are more accessible for maintenance, and require less vertical space in the structure. Five pumps would provide a total of 280 cfs and four smaller pumps would handle lower flows, trim flows between the large pumps, and provide redundancy in case one of the large pumps is out of service. A bay would be provided in the plant that would allow the City of Durango to use the facility to pump water to its terminal reservoir. The rate of pumping would be governed by:

- Downstream senior water rights demands on the river
- The amount of water in the river
- Minimum bypass flows
- The capacity of Durango Pumping Plant
- Design-based reservoir filling criteria

The Durango Pumping Plant would be limited to 240 cfs in June to avoid impacting endangered fish flow requirements in the San Juan River. Pumping would be further limited, when all other downstream requirements are satisfied, to allow the following bypass flows in the Animas River at the pumping plant intake: October through November - 160 cfs, December through March - 125 cfs, and April through September - 225 cfs.

Ridges Basin Inlet Conduit - The conduit route from the Animas River up Bodo Draw to Ridges Basin was selected because it provides the lowest pumping lift between the river and the active storage pool of the 120,000 af Ridges Basin Reservoir. It is also relatively close to the river and the terrain is not unusual for pipeline construction.

The route of the conduit from the pumping plant to the reservoir is along the trace identified in the 1996 FSFES. It proceeds southerly from the pumping plant, turns southwest to cross CR 211 and the Bodo Creek flow line, continues to a point some 1200 feet south of CR 211 then turns up Bodo Draw, south of the creek line, and crosses the crest alongside CR 211. An air vent of about 12 inches diameter would stand about 8 feet above ground just before the crest of the ridge.

Construction would include about 11,200 feet of 66-inch diameter steel pipe with a corrosion-protective coating and about 800 feet of improvements in the discharge course toward the reservoir. The conduit would be buried in a trench at a normal depth of five to eight feet below the ground and backfilled so that upon completion of construction, the terrain would be returned to natural contours. To conserve pumping lift, the cost of various depths of additional excavation across the crest at top of the draw, including tunneling, were compared with the savings in future power costs. It was found most economical to excavate up to 35 feet deep at the crest and maintain a maximum flow line elevation of 6,950 feet. The conduit would terminate on the reservoir side of the crest with a stilling structure from which the flow would continue down to the reservoir in a rock-lined open channel.

Ridges Basin Dam and Reservoir

Ridges Basin Reservoir would have the following features:

- Maximum Reservoir Capacity - 120,000 af
- Maximum Water Surface Area - 1,500 acres at elevation 6,882 feet
- Minimum Reservoir Capacity - 30,000 af
- Minimum Water Surface Area - 870 acres at elevation 6,815 feet
- Active Capacity - 90,000 af
- Inactive Capacity - 30,000 af

Ridges Basin Reservoir would be formed by the construction of Ridges Basin Dam on Basin Creek, approximately three miles upstream from its confluence with the Animas River. To retain 120,000 af and provide for flood storage, a dam with a crest elevation of 6,892 feet would be required. The dam height would be 217 feet above streambed. The dam site is defined by narrowing of the downstream end of Ridges Basin with a prominent sandstone ridge to the left (northeast) of Basin Creek and two sandstone and siltstone ridges about 500 feet apart to the right. The preferred dam for the 120,000 af capacity reservoir would use the prominent sandstone for the left abutment and the more upstream of the two ridges for the right abutment. This is the same alignment that was selected for the large dam described in the 1996 FSFES. With the smaller dam now proposed, the right abutment of the planned embankment would not encounter the coal bearing formation that was a concern in the 1980 FES.

The valley floor at the dam site is covered with 40 to 90 feet of alluvial deposits over shale with lesser amounts of sandstone near the abutments. The alluvial material consists of sandy clay, clayey sand, and lean clay with varying amounts of gravel. The water table reaches a maximum of about 45 feet below the ground surface upstream of the dam site and approaches ground surface near the downstream toe of the dam site.

A tunnel through the left abutment would serve as the reservoir outlet. The outlet works include an intake approach channel, intake structure, upstream pressurized tunnel, gate chamber with access adit, open channel flow downstream tunnel, and stilling basin and discharge channel. The main gates would have an emergency release capacity of 1500 cfs. Jet-flow valves would be provided to control operational releases up to 250 cfs, one for the planned releases to meet project water demands up to 130 cfs and another to meet releases associated with the future use of the Colorado Ute Tribal water. The stilling basin would be adequate to contain flows discharged during annual testing of gate and valve operation. Flanges would be provided in the gate chamber for connection of future distribution pipelines.

Basin Creek falls about 420 feet along its 3.2 mile course from the dam to the Animas River. Planned water supply from Ridges Basin Reservoir range from 25 to 130 cfs and future releases for non-binding Colorado Ute water use development could amount to an additional 120 cfs. These releases would exceed the normal rainfall runoff in Basin Creek and an increase in silt transport to the Animas River is expected until equilibrium is achieved. Alternative means of controlling silt transport were investigated, including:

- Armor the channel with rock
- Replace the streambed with a concrete-lined channel
- Install a number of check or vortex weirs
- Release flows into a conduit laid alongside of Basin Creek

Creating steps in the channel with a series of check and drop or vortex weirs was selected as the preferred means of control. It would produce an increase in silt transport initially but would stabilize with use. It would also create some wetlands. The steps would be placed about 150 feet apart throughout the 2.5 miles of the creek bed that is incised into a clayey sand formation. The lower 0.7 mile of creek has frequent natural rock controls and would accept the additional flow without significant modification.

Access for construction activities would be from CR 211 and space for construction equipment and supplies would be located in the reservoir basin. Future access for operation and maintenance would connect with CR 213, La Posta Road, and proceed along the general alignment of existing private roads to Borrow Area B, then along the northerly canyon side up Basin Creek to the dam. A roadway across the downstream slope of the dam would provide access to the dam crest at the right (southwest) abutment.

Navajo Nation Municipal Pipeline

The Navajo Nation has requested that a water conveyance pipeline (the NNMP) be included as a structural component of the ALP Project, to upgrade the service now being provided for eight Navajo Nation chapters in the Farmington - Shiprock area, and to replace the 30-year old pipeline now in place. The Navajo Tribal Utility Authority (NTUA) delivers water to eight Navajo Chapters: Upper Fruitland, San Juan, Nenahnezad, Hogback, Sanostee, Shiprock, Cudei, and Beclaibito.

The new pipeline would deliver 4,560 afy (2,340 afy of depletion) of M&I water from the ALP Project to these eight chapters. The 4,560 afy of water represents growth projections and future M&I water requirements. Existing M&I water requirements are now being provided through an existing pipeline from the City of Farmington s water treatment plant. The NNMP would replace the existing pipeline with a new, larger pipeline. It would generally follow the alignment of the existing pipeline for nearly two-thirds of the route from Farmington to Hogback, with a route deviation on the western portion from Hogback to Shiprock.

Electrical Transmission Lines

Western Area Power Administration (WAPA) would provide electrical power to the ALP Project and would conduct a systems studies to determine how power could be delivered. WAPA would then conduct an environmental review of its electrical power delivery system.

Ridges Basin Reservoir Recreation Elements

Refined Alternative 4 consists of two recreation-related elements within Ridges Basin. One element is the establishment and maintenance of a 30,000 af minimum pool in Ridges Basin Reservoir for the

purpose of enabling the reservoir to support a fishery and to improve water quality. The second element, not directly incorporated into this alternative, consists of the development of facilities that would provide a broad range of recreational activities at the reservoir site and surrounding area.

Operational parameters would, however, allow for drawdown below this minimum pool during some dry years. This allowance results in reduced construction costs and capacity that would otherwise be necessary, and would likely have a minimal impact on the fishery within the reservoir.

It is anticipated that under Refined Alternative 4, a non-federal entity could develop expanded recreational facilities within Ridges Basin. Such development would be subject to coordination with and approval by Reclamation. The Ridges Basin Reservoir surface area under the Refined Alternative 4 envisions the following characteristics as a potential recreational development scenario:

- 1,980 people at one time
- 218,400 annual user days
- 10 miles of hiking trails (same as proposed in the 1996 FSFES)
- 196 camping units
- 37 picnic units and one group site
- One, four-lane boat ramp and 26 boat slips
- Two-lane county access road
- 591 parking stalls
- Public beach
- Fish cleaning station
- Entrance station and administrative building

Refined Alternative 4 includes a program to acquire and develop lands to mitigate vegetation, wildlife, and wetland losses associated with the project. Land uses of acquired lands at Ridges Basin would be designated to protect big game migration corridors and other wildlife uses.

9.1.2 Non-Structural Component of Refined Alternative 4

The non-structural component of Refined Alternative 4 would consist of the creation of a water acquisition fund ($40 million) that could be used by the Colorado Ute Tribes to acquire water rights on a willing buyer/willing seller basis in an amount sufficient to allow the Tribes approximately 13,000 afy of depletion in addition to the depletion from the structural portion of the project. However, to provide flexibility in the use of the fund, authorization would allow some or all of the funds to be redirected for on-farm development, water delivery infrastructure, and other economic development activities.

- Pine River Basin - Purchase 2,300 acres of land and leave water on the land
- La Plata River Basin - Purchase 2,400 acres of land and leave water on the land
- Animas/Florida River Basins - Purchase 2,300 acres of land and leave the water on the land
- Mancos River Basin - Purchase 3,300 acres of land leave water on the land

9.2 Refined Alternative 6

Refined Alternative 6 proposes that water rights under the Settlement Act for the Colorado Ute Tribes be obtained through augmentation and the coordinated operation of existing federal projects in the area proximal to the Tribes reservations and through purchase of irrigated agricultural lands and associated water rights. Refined Alternative 6 has been modified to the equivalency of the depletion amounts in Refined Alternative 4 in order to analyze both alternatives on a commensurate or equivalent basis. Like Refined Alternative 4, Refined Alternative 6 also consists of two components:

- One component would be equivalent to the structural component of Refined Alternative 4 by developing up to 57,100 afy of depletions in the San Juan Basin and it would serve the same M&I needs as served by Refined Alternative 4 with one exception. Instead of serving the Red Mesa regional demand of 2,102 afy, Refined Alternative 6 would serve a corresponding demand in the Montezuma County area.
- A second component for Refined Alternative 6 was developed under the assumption that the water could be acquired to develop an equal amount of depletions of 13,000 afy and in a manner similar to Refined Alternative 4 by purchasing agricultural lands and associated water rights.

Sources of water for Refined Alternative 6 include: the purchase of stored water from Red Mesa Reservoir, the coordinated operation of existing reservoirs with streamflows in the San Juan River Basin for more efficient utilization of water supplies, and the raising of Lemon Dam. Other elements of Refined Alternative 6 include the NNMP and measures to avoid impacting wetlands from purchase of water and transferring to M&I use.

9.2.1 Component of Refined Alternative 6 Commensurate with Refined Alternative 4 for Developing up to 57,100 afy of Depletions to Serve Municipal and Industrial Needs

Analysis of water from various sources included:

- Purchase of land and water rights
- Coordinated operation of existing storage reservoirs with streamflows for more efficient utilization of water supplies
- Purchase of storage space in existing non-federal facilities
- Raising of Lemon Dam

9.2.1.1 Purchase of Land and Water Rights to Yield 17,432 afy of Depletions

Land (11,933 acres) and associated water rights would be purchased in the Pine, La Plata, and Mancos Rivers, and McElmo Creek Basins to supply a yield of 17,432 afy of historical depletions. This does not include the land required to supply the 13,000 afy depletion.

Pine River Basin

A total of 10,000 acres of non-Colorado Ute irrigated land would be purchased in the Pine River Basin. The associated 15,114 af of average annual depletion would be removed from the land and allowed to flow into Navajo Reservoir under the same delivery pattern that would have occurred to the irrigated land. This would become project water with the delivery point at Navajo Reservoir for purposes of administering the purchased water rights in the Pine River.

La Plata Basin

To meet the demands not met by available streamflow, a total of 785 acres of irrigated land would be purchased and the associated average annual depletion of 521 af transferred to M&I use.

Mancos Basin

To meet the demands not met by available streamflow, a total of 500 acres of irrigated land would be purchased and the associated average annual depletion of 761 af transferred to M&I use.

McElmo Creek (Montezuma County)

A total of 648 acres, sufficient to provide a firm yield depletion of 1,036 afy, would be purchased and the water transferred to M&I use to satisfy regional demand in Montezuma County. All water resulting from these purchases from McElmo Creek would be for the benefit of the Ute Mountain Ute Tribe.

9.2.1.2 Coordinated Operation of Existing Storage Reservoirs with Streamflows for Increased Availability of Water under Refined Alternative 6

Several federal storage facilities were evaluated for coordinated operation with streamflows in the San Juan River Basin for more efficient utilization of water supplies

Navajo Reservoir

Navajo Reservoir would be operated to supplement available Animas River flows in meeting the SJWC and Navajo Nation demands, the Farmington, Aztec and Kirtland regional water demands; and the demands for the non-binding uses at the coal mine, coal-fired power plant and gas-fired power plant for the Colorado Ute tribes. To the extent that capacity is not sufficient, additional irrigated acreage could be purchased and retired above the reservoir to augment the water supply.

Vallecito Reservoir

Vallecito Reservoir would operate as it has historically been operated, storing water to deliver any water transferred from irrigation to M&I use in the same pattern as for irrigation.

Jackson Gulch Reservoir

Jackson Gulch Reservoir would be operated to store agricultural water purchased for conversion to M&I and release according to demand as long as such operation did not impact the delivery of agricultural water to existing right holders. No additional yield would come from Jackson Gulch Reservoir. In summary, approximately 36,891 afy may be available through coordinated operation of Navajo Reservoir with stream flows in the San Juan River for more efficient utilization of water supplies. The amounts should be considered as preliminary and will be revised through subsequent re-evaluation.

9.2.1.3 Purchase of Storage Space in Red Mesa Reservoir

Approximately 200 acre-feet of space would be purchased in Red Mesa Reservoir.

9.2.1.4 Enlarging Lemon Reservoir

The capacity of Lemon Reservoir would be increased from approximately 40,000 af to 50,000 af by raising the dam 11.5 feet. The increased capacity would be used to deliver water to the Florida Mesa Housing Unit and supplement Animas River diversions to meet the City of Durango demands and the Durango regional demands. The average annual depletion supplied by Lemon Reservoir to these uses is about 500 af, ranging from zero to 2,500 af per year. More detailed water operation modeling studies would need to be completed to verify the yield from enlarging Lemon Reservoir.

Dam Configuration

Lemon Dam is a zoned earth and rock fill dam with a height of 215 feet above the streambed of the Florida River. The crest at elevation 8,167 feet is 30 feet wide and 1,360 feet long. The upstream slope is 2.5:1. Raising the dam involves increasing the height and thickness of the impervious zone near the dam crest and increasing the embankment on the downstream slope to support the added height.

There is a landslide upstream of the spillway approach channel that has been monitored for several years. Although it poses no threat to the subsurface intake of the outlet works or to the reservoir, it is planned to remove earth from the upper portion of the slide and render it more stable. This would be carried out as part of the dam height augmentation.

Spillway Requirements

In increasing the height of Lemon Dam to increase storage, the deficient capacity of the spillway must also be corrected. Reclamation studies indicate that the existing spillway cannot safely pass the Probable Maximum Flood (PMF) with three feet of free board. To estimate the scope of construction required, a spillway configuration was developed at the conceptual level that could safely pass the PMF with the increased height of the dam.

Flood routings were performed for several alternative spillway configurations with the U.S. Army Corps of Engineers HEC-1 Flood Hydrograph Package. Alternative widths of uncontrolled spillways with crest elevations at the maximum normal pool level required widening the existing spillway or adding a new left abutment spillway. The gated spillway alternatives either added gates on the existing spillway crest or added gates to a widened spillway crest. Different dam crest raises are involved.

Selected Spillway Concept and Dam Height Increase

The 54-foot-wide gated spillway was selected as the alternative that would require the least disruptive construction. It results in about the same dam crest level as a 200-foot uncontrolled crest alternative. To safely pass the PMF and contain 10,000 af additional storage, the dam crest level would be raised by about 11.5 feet above the existing crest.

Construction

Two tainter gates, each 27 feet wide by 20 feet high, would be added to the existing spillway crest along with a central pier to support the gates. The spillway walls in the vicinity of the gates would be demolished and rebuilt to a higher level with additional structural support for the gates. The remainder of the spillway chute and stilling basin walls would be raised by approximately 10 feet.

Augmentation of the downstream slope involves adding about 52 feet, measured horizontally, to the width of the dam to maintain the 2:1 slope from the raised crest. At the base of the dam, 45,000 cubic yards would excavated to reach a foundation for the downstream fill. A total of approximately 650,000 cubic yards of fill materials are needed to complete the increased height of the dam. Sources of fill materials are the excavated material and borrow areas that would be developed on private lands either upstream of the existing reservoir or downstream from the dam. Haul distances are on the order of five miles and highway type vehicles would be required.

Construction could be completed in three years with a normal weather pattern. Spillway gates would be fabricated early in the year and spillway field construction would start after the first year overflow period and be completed during the year. Earthwork would start early the first year and finish late the third year, taking advantage of the normal low reservoir level in the fall for the crest area rework.

Construction Cost

The estimated construction cost for raising Lemon Dam to gain an additional 10,000 af of capacity would be approximately $28 million. This represents a high cost for the additional water yield from the reservoir.

9.2.2 Component of Refined Alternative 6 (Commensurate With the Non-structural Component of Refined Alternative 4)

9.2.2.1 Purchase of Land and Water Rights in Animas and Florida River Basins

Acreage sufficient to provide a firm yield depletion of 6,500 af would be purchased in the Animas and Florida Basins as an equivalent to the non-structural component of the Refined Alternative 4. The water would remain on the land as described in Refined Alternative 4. With a depletion factor of 1.4 af per acre, 4,643 acres would be required.

9.2.2.2 Purchase of Land and Water Rights in McElmo Creek (Montezuma County)

Approximately 4,062 acres, an amount sufficient to provide a firm yield depletion of 6,500 af would be purchased in the Montezuma Valley, either within the Montezuma Valley District or elsewhere in the Dolores Project service area as an equivalent to the non-structural component of Refined Alternative 4. The water would remain on the land.

9.2.3 Other Elements of Refined Alternative 6

9.2.3.1 Navajo Nation Municipal Pipeline

The NNMP described as part of Refined Alternative 4 would be a component of this alternative as well.

9.2.3.2 Design for Avoidance of Wetland Impacts

When water is transferred off irrigated land, the wetlands associated with the water losses from those irrigated lands would lose their water supply and cease to be wetlands. A portion of those wetlands impacted could be avoided if a water source remains available for the affected wetlands. This could be accomplished by leaving a portion of the water supply at the turnout for the parcel and routing the volume of water that would normally supply wetlands through the parcel and to the associated wetlands.

9.3 COMPARISON OF REFINED ALTERNATIVE 4 AND REFINED ALTERNATIVE 6

Table 7 is a comparison of Refined Alternative 4 and Refined Alternative 6. The environmental setting, potential environmental impacts, and proposed mitigation measures to reduce or eliminate environmental impacts are discussed in detail in the DSEIS for Refined Alternative 4 and Refined Alternative 6. **Table 8** provides a summary of the significant (S) and potentially significant (PS) impacts associated with Refined Alternative 4 and Refined Alternative 6.

Table 7
Comparison of Refined Alternative 4 and Refined Alternative 6
on a Commensurate Level

Parameter	Refined Alternative 4	Refined Alternative 6
Components of the two alternatives to provide up to 57,100 afy of depletions including evaporation losses		
Water Supply (depletions)	57,100 afy	54,865 afy
New Depletions	(57,100 afy)	(37,433 afy)
Historical Depletions		(17,932 afy)
Time to Implement This Component to Satisfy Colorado Ute Tribal Water Rights Claims	5 years	30 years
Ability to Satisfy Colorado Ute Tribal Water Rights Claims (primary reason for purpose and need of the project)	Would satisfy Colorado Ute Tribal water rights claims with little or no risk.	Would satisfy Colorado Ute Tribal water rights claims but contains a significant element of risk.
Most Significant Environmental Aspects	134 acres wetland impacts.	600 acres of wetland impacts. This assumes that 50% of wetland impacts can be avoided. This may be difficult to obtain.
Technical and Economic Aspects	Represents a conventional and assured solution.	More complex and risky solution. Land purchase opportunity and water yield are subject to considerable uncertainty.
Capital Costs to Implement Each Plan, Including the Acquisition of Water Rights	$290.6 million. This cost has a high degree of confidence.	$273 million. Significant elements of uncertainty associated with this alternative cost, including the escalating values of land and the assumption that significant potential losses in wetlands can be avoided.
Overall Risk	Little to no risk.	Considerable risk associated with purchasing land and water rights.
Component to acquire 13,000 afy of historical depletions		
Purchase Land for Water Rights		
Pine River Basin	2,300 acres 3,220 afy	Not applicable
Animas/Florida River Basin	2,300 acres 3,220 afy depletion	4,643 acres 6,500 af depletion
La Plata River Basin	2,400 acres 2,160 afy depletion	Not applicable

Table 7 (continued)
Comparison of Refined Alternative 4 and Refined Alternative 6
on a Commensurate Level

Parameter	Refined Alternative 4	Refined Alternative 6
Mancos River Basin	3,300 acres 4,290 afy depletion	Not applicable
McElmo Creek	Not applicable	4,062 acres 6,500 afy depletion
Amount of Land Purchased	10,300 acres	8,705 ac
Amount of Historical Depletions Acquired	13,000 afy depletion	13,000 afy depletion
Time Frame for Purchase	15 years	15 years
Risks Associated with Land Purchase	There are significant risks associated with purchasing 10,300 acres with the water acquisition fund. Not all land could be purchased in one year therefore land must be purchased over time. Land value inflation would apparently exceed interest earned in an interest bearing account. This would require that significantly more than $40 million be deposited at the present time.	The same kind of risks as shown under Refined Alternative 4 would also occur with Refined Alternative 6. In addition, the purchase of 11,933 acres coupled with the purchase of 8,705 acres with the acquisition of water rights would add to the difficulty and risk of being able to purchase the required land and associated water rights.
Overall Assessment		
" Refined Alternative 4 is a straightforward solution with little to no risk. " The capital cost of Refined Alternative 4 at $290.6 million is only slightly higher than the capital cost of Refined Alternative 6 at $273 million. However, the cost estimate for Refined Alternative 4 is more reliable, while the cost for Refined Alternative 6 has risks which could add significantly to the cost estimate. " Refined Alternative 4 could be implemented in a short time frame, whereas Refined Alternative 6 could take 30 years or longer.		

Table 8
Summary of Impacts for Refined Alternative 4 and Refined Alternative 6

Impact	Significance
WATER RESOURCES/HYDROLOGY	
Refined Alternative 4 Hydrology Impact 2 Impacts to existing flow are anticipated in the San Juan River as a result of project operation that would reduce water supply for future Indian trust water uses.	PS
Refined Alternative 4 Hydrology Impact 3 Project return flow from non-binding uses would increase flows in the La Plata River in New Mexico in an area that is now water short. Unless these return flows are protected or the depletion of them replaced, downstream depletion would increase above 57,100 afy with subsequent impact to endangered fish flows.	PS
Refined Alternative 6 Hydrology Impact 2 Impacts to existing flow are anticipated in the San Juan River as a result of operation of Refined Alternative 6 that would reduce water supply for future Indian trust water uses.	PS
WATER QUALITY	
Refined Alternative 4 Water Quality Impact 1 Construction of the proposed Durango Pumping Plant would result in temporary increases in suspended sediment loads in the Animas River.	PS
Refined Alternative 4 Water Quality Impact 2 Construction of the Navajo Nation Municipal Pipeline could temporarily increase suspended sediment loads in the San Juan River.	PS
Refined Alternative 4 Water Quality Impact 3 Construction of the Ridges Basin Dam and outlet structure could temporarily increase sediment loads in Basin Creek.	PS
Refined Alternative 4 Water Quality Impact 6 Erosion and sediment discharge during construction of end use water conveyance pipelines could increase suspended sediment loads in the Animas, La Plata, and Mancos Rivers.	PS
VEGETATION	
Refined Alternative 4 Vegetation Impact 1 Approximately 1,500 acres of upland vegetation would be permanently lost by the construction of Ridges Basin Reservoir and Dam.	S
Refined Alternative 4 Vegetation Impact 2 Construction of Durango Pumping Plant, the relocation of County Road 211, construction of new recreation facilities, and construction of new operation and maintenance access roads would permanently impact approximately 67 acres of upland vegetation.	S
Refined Alternative 4 Vegetation Impact 3 Construction of Ridges Basin Reservoir and Dam would permanently inundate or fill 121 acres of wetlands/riparian vegetation cover.	S

Table 8 (continued)
Summary of Impacts for Refined Alternative 4 and Refined Alternative 6

Impact	Significance
Refined Alternative 4 Vegetation Impact 4 Construction and initial operation of Ridges Basin Reservoir would destroy approximately 13 acres of wetland/riparian vegetation within Basin Creek downstream of the proposed dam.	S
Refined Alternative 4 Vegetation Impact 5 Approximately 30 acres of upland and approximately 1 acre of riparian/wetlands would be temporarily impacted by the construction of the Ridges Basin inlet conduit.	PS
Refined Alternative 4 Vegetation Impact 8 Construction of water conveyance pipelines could result in the loss of between 20 and 300 acres of wetland and riparian vegetation.	S
Refined Alternative 6 Vegetation Impact 3 Acquisition of water rights and cessation of water conveyance and irrigation in the Pine, La Plata, and Mancos River Basins, and McElmo Creek Basin could result in the conversion of over 600 acres of wetland and riparian vegetation to upland vegetation cover.	S
Refined Alternative 6 Vegetation Impact 4 Construction of water conveyance pipelines could result in the loss of wetland and riparian vegetation at the crossing of creeks, drainage channels, canals, and floodplains.	S
WILDLIFE	
Refined Alternative 4 Wildlife Impact 1 Inundation of Ridges Basin and other direct and indirect habitat losses would result in the loss of approximately 3,000 acres of wildlife habitat used by a variety of wildlife species, most notably big-game animals, principally mule deer and elk.	S
Refined Alternative 4 Wildlife Impact 2 Construction of the gas pipeline relocation corridor, road relocation, and recreation area development associated with Refined Alternative 4 would have a temporary adverse effect on mule deer, elk and possibly elk calving areas.	S
Refined Alternative 4 Wildlife Impact 3 Once constructed, the long-term effects of the use of the relocated road and recreation areas would reduce use of the area by elk and deer during the summer period and although the areas would continue to be used as winter range, increased use of the area by humans would disrupt deer and elk habitat utilization and behavior.	S
Refined Alternative 4 Wildlife Impact 4 Construction of the Ridges Basin Dam, pumping plant, inlet conduit line, new road alignment for CR 211, reservoir access roads, relocation of transmission lines, and recreation facilities could impact nesting golden eagles.	S
Refined Alternative 4 Wildlife Impact 5 Development of Ridges Basin Reservoir and associated recreation area would increase use in the general area that could disturb nesting golden eagles on Carbon Mountain.	S

Table 8 (continued)
Summary of Impacts for Refined Alternative 4 and Refined Alternative 6

Impact	Significance
Refined Alternative 4 Wildlife Impact 7 Construction of water conveyance pipelines would result in the loss of 20 to 300 acres of wetland and riparian wildlife habitat. Construction activities, noise, and human intrusion could result in short-term disturbance to wildlife security.	S
Refined Alternative 6 Wildlife Impact 1 Raising Lemon Reservoir Dam, which would inundate 60 acres of ponderosa pine and other wildlife habitat, could result in short-term construction disturbance to sensitive wildlife, and longer-term wildlife conflicts due to access road relocation around the reservoir.	PS
Refined Alternative 6 Wildlife Impact 3 Acquisition of water rights, converting irrigation water to M&I uses and cessation of irrigation in the Pine River, La Plata River, Mancos River, Dolores River, and McElmo River basins would result in the conversion of over 600 acres of wetland and riparian wildlife habitat to upland habitat.	S
Refined Alternative 6 Wildlife Impact 4 Construction of water conveyance pipelines would result in the loss of 20 to 300 acres of wetland and riparian wildlife habitat. Construction activities, noise, and human intrusion could result in short-term disturbance to wildlife security.	S
AQUATIC RESOURCES	
Refined Alternative 4 Aquatic Resources Impact 3 The introduction of trace elements into Ridges Basin Reservoir from the Animas River could lead to the bioaccumulation of these elements into the food chain.	PS
Refined Alternative 4 Aquatic Resources Impact 4 Reductions in flows that correlate to significant decreases in wetted perimeter and average depths could impact native fish in the Animas River.	PS
Refined Alternative 4 Aquatic Resources Impact 5 Stocked fingerling trout and native fish fry and fingerlings could be entrained or impinged on intake screens at the Ridges Basin Pumping Plant.	PS
Refined Alternative 4 Aquatic Resources Impact 6 Stocked fingerling trout, and native fish fry and fingerlings could be stranded downstream of the Durango Pumping Plant if pumping rates are not staged.	PS
Refined Alternative 4 Aquatic Resources Impact 7 Populations of native fish in the Animas and San Juan Rivers and endangered fish in the San Juan River could be reduced by the competitive interaction with non-native fish species escaping from Ridges Basin Reservoir.	PS
SPECIAL STATUS SPECIES	
Refined Alternative 4 Special Status Species Impact 2 Implementation of Refined Alternative 4 could potentially affect the food base of bald eagles.	S

Table 8 (continued)
Summary of Impacts for Refined Alternative 4 and Refined Alternative 6

Impact	Significance
Refined Alternative 4 Special Status Species Impact 3 Construction of the Navajo Nation Municipal Pipeline could impact southwestern willow flycatcher nesting habitat at two crossings of the San Juan River.	PS
Refined Alternative 4 Special Status Species Impact 4 The operation of the ALP Project without offsetting measures could adversely affect the Colorado pikeminnow and razorback sucker in the San Juan River.	S
Refined Alternative 4 Special Status Species Impact 5 Survival and recovery of endangered fish in the San Juan River could be jeopardized by competitive interaction with nonnative fish released from Ridges Basin Reservoir to the Animas River.	PS
Refined Alternative 6 Special Status Species Impact 1 Raising Lemon Reservoir Dam could result in short-term construction-related disturbance to bald eagle roosting and feeding behavior.	PS
Refined Alternative 6 Special Status Species Impact 2 Construction of the Navajo Nation Municipal Pipeline could impact southwestern willow flycatcher nesting habitat at two crossings of the San Juan River.	PS
Refined Alternative 6 Special Status Species Impact 3 Acquisition of water rights resulting in the abandonment and dewatering of irrigation canals and altering existing hydrology within the Pine, La Plata River, Mancos, and McElmo River Basins, may adversely affect southwestern willow flycatcher habitat near surface waters.	PS
GEOLOGY AND SOILS	
Refined Alternative 4 Geology Impact 4 Dewatering for construction of Ridges Basin Dam and filling of the reservoir could increase the natural seepage and surface release of coal-bed methane gas.	PS
Refined Alternative 4 Soils Impact 1 Ground disturbance during construction of structural and non-binding components would expose soils to potential increases in wind and water erosion and increase risk of slope instability.	S
CULTURAL RESOURCES	
Refined Alternative 4 Cultural Impact 1 Historic properties would be adversely affected. Construction activities associated with the structural components and inundation of Ridges Basin could disturb or destroy cultural resources eligible for inclusion in the NRHP.	S
Refined Alternative 4 Cultural Impact 2 Historic properties would be affected. Operation and recreation activities that would be associated with Ridges Basin Reservoir would create potential for disturbance of cultural resources eligible for inclusion in the NRHP.	S

Table 8 (continued)
Summary of Impacts for Refined Alternative 4 and Refined Alternative 6

Impact	Significance
Refined Alternative 4 Cultural Impact 3 Historic properties would be affected. Construction disturbance associated with the potential end uses and conveyance systems would create potential for disturbance and increased public access to cultural resources eligible for inclusion in the NRHP.	PS
Refined Alternative 4 Cultural Impact 4 Activities described in Refined Alternative 4 Cultural Impacts 1-3 could result in adverse impacts to exposed human remains and sacred sites.	S
Refined Alternative 4 Paleontologic Impact 1 Construction activities associated with the structural components and inundation of Ridges Basin could disturb or destroy fossils of scientific significance in Late Cretaceous and Early Cenozoic age.	PS
Refined Alternative 4 Paleontologic Impact 2 Operation and recreation activities that would be associated with Ridges Basin Reservoir would create potential for disturbance of important paleontologic resources within Ridges Basin.	PS
Refined Alternative 6 Cultural Impact 1 Historic properties could be affected. Construction activities associated with the structural components and inundation of additional shoreline surrounding Lemon Reservoir could disturb or destroy cultural resources eligible for inclusion in the NRHP.	S
Refined Alternative 6 Cultural Impact 2 Historic properties could be affected. Operation and activities at relocated recreation areas at an enlarged Lemon Reservoir would create potential for disturbance and increased public access to cultural resources eligible for inclusion in the NRHP.	PS
Refined Alternative 6 Cultural Impact 3 Historic properties could be affected. Construction disturbance associated with the potential end uses and conveyance systems would create potential for disturbance and increased public access to identified and unidentified cultural resources with known or unknown eligibility for inclusion in the NRHP.	S
Refined Alternative 6 Cultural Impact 4 Construction and operation activities described in Refined Alternative 6 Cultural Impacts 1-3 could result in adverse impacts to exposed human remains and sacred sites.	S
Refined Alternative 6 Cultural Impact 5 Historic properties might be affected. Eliminating agricultural irrigation from certain lands could alter farming practices in these areas and change the potential for cultural resource disturbance within these agricultural areas.	PS
AGRICULTURE	
Refined Alternative 6 Agriculture Impact 2 Purchase of irrigated farmland on any irrigation ditch that would cause disruption of historic irrigation practices to remaining appropriators.	PS

Table 8 (continued)
Summary of Impacts for Refined Alternative 4 and Refined Alternative 6

Impact	Significance
RECREATION	
Refined Alternative 4 Recreation Impact 2 Operation and presence of the Durango Pumping Plant would adversely affect the quality of the boating experience.	PS
SOCIOECONOMICS	
No significant or potentially significant impacts were identified for socioeconomics.	
LAND USE	
Refined Alternative 4 Land Use Impact 1 Increased recreation within Ridges Basin could increase violations of CDOW restrictions within Bodo State Wildlife Area and could reduce the rural quality of the surrounding area.	S
HAZARDOUS MATERIALS	
Refined Alternative 4 Hazardous Materials Impact 1 Construction of the Durango Pumping Plant could expose contaminated materials.	S
Refined Alternative 4 Hazardous Materials Impact 2 Hazardous materials used for the construction of the Durango Pumping Plant and Ridges Basin Dam could cause stream pollution.	PS
TRANSPORTATION	
Refined Alternative 4 Transportation Impact 1 Increased delays at the intersection of West Frontage Road and County Road 211 could result from construction worker peak hour commute trips during the construction of the structural components.	S
Refined Alternative 4 Transportation Impact 2 Increased delays at the intersection of U.S. 550/160 and West Frontage Road could result from construction worker peak hour commute trips.	S
Refined Alternative 4 Transportation Impact 3 Physical degradation of CR 211 could occur as a result of construction vehicle traffic associated with construction of the structural components.	S
Refined Alternative 4 Transportation Impact 7 Recreation visitation traffic associated with construction of the structural components could exceed the capacity of CR 141 and other access roads.	S
Refined Alternative 6 Transportation Impact 1 Construction associated with raising Lemon Dam and Reservoir would increase traffic on local roadways.	S

Table 8 (continued)
Summary of Impacts for Refined Alternative 4 and Refined Alternative 6

Impact	Significance
AIR QUALITY	
Refined Alternative 4 Air Quality Impact 1 Fugitive dust and exhaust emissions from the construction of the Durango Pumping Plant, Ridges Basin Inlet Conduit, Ridges Basin Dam, and the Navajo Nation Municipal Pipeline could cause or contribute to temporary exceedences of an NAAQS or affect the health of nearby sensitive persons.	S
Refined Alternative 4 Air Quality Impact 4 Dust and stack emissions would occur from operation of a coal-fired power plant and coal mine and a gas-fired power plant.	S
Refined Alternative 6 Air Quality Impact 1 Fugitive dust and exhaust emissions from the enlargement of Lemon Dam and construction of the Navajo Nation Municipal Pipeline could cause or contribute to temporary exceedence of an NAAQS or affect the health of nearby sensitive persons.	S
Refined Alternative 6 Air Quality Impact 2 Fugitive dust emissions could occur as a result of irrigation water being taken off of the land under the non-structural component.	PS
Refined Alternative 6 Air Quality Impact 4 Dust and stack emissions would occur from operation of a coal-fired power plant, coal mine, and a gas-fired power plant.	S
NOISE	
Refined Alternative 4 Noise Impact 1 Noise generated during construction of the Durango Pumping Plant and Ridges Basin Inlet Conduit could disturb nearby residents and other sensitive receptors.	S
Refined Alternative 4 Noise Impact 2 Noise from dynamite blasting for pipeline trenching and foundation excavation could exceed local noise standards and disturb nearby residents and other sensitive receptors.	S
Refined Alternative 4 Noise Impact 3 Operation of the Durango Pumping Plant could generate noise levels that exceed local standards and disturb recreationists at Santa Rita Park (formerly Gateway Park) and on the Animas River.	PS
Refined Alternative 4 Noise Impact 4 Noise generated by the construction of Ridges Basin Dam, the relocation of CR 211, gas pipeline relocation, and the construction of a recreation area could disturb golden eagle nesting on Carbon Mountain.	S
Refined Alternative 4 Noise Impact 5 Noise generated by recreational activities associated with public recreation on Ridges Reservoir and the potential adjacent recreation area could disturb golden eagle nesting on Carbon Mountain.	S
Refined Alternative 4 Noise Impact 6 Construction of the end uses and conveyance systems identified under the non-binding scenario could generate noise that could disturb nearby sensitive receptors.	PS

Table 8 (continued)
Summary of Impacts for Refined Alternative 4 and Refined Alternative 6

Impact	Significance
Refined Alternative 6 Noise Impact 2 Noise from dynamite blasting for pipeline trenching and spillway enlargement could exceed local noise standards and disturb nearby residents and other sensitive receptors.	S
Refined Alternative 6 Noise Impact 3 Construction of the end uses and conveyance systems identified under the non-binding scenario could generate noise that could disturb nearby sensitive receptors.	PS
PUBLIC HEALTH AND SAFETY	
Refined Alternative 4 Public Health and Safety Impact 1 Public entry into construction areas and exposure to construction accidents.	S
Refined Alternative 4 Public Health and Safety Impact 2 Materials and equipment transport could create hazards to the public on local roadways and delay emergency vehicles.	S
Refined Alternative 4 Public Health and Safety Impact 4 Construction activities associated with end uses and conveyance systems under the non-binding scenario would create potential for injury.	S
Refined Alternative 4 Public Health and Safety Impact 5 Increased coal bed methane gas seepage that may occur as a result of developing Ridges Basin Dam and Reservoir could create increased risk of injury to workers or the public.	PS
Refined Alternative 4 Public Health and Safety Impact 6 During operation of the project, trespass onto properties containing project facilities or entrance into Basin Creek could expose the public to increased risk of injury.	S
Refined Alternative 6 Public Health and Safety Impact 1 Public entry into construction areas and exposure to construction accidents.	S
Refined Alternative 6 Public Health and Safety Impact 2 Materials and equipment transport could create hazards to the public on local roadways and delay emergency vehicles.	S
Refined Alternative 6 Public Health and Safety Impact 3 Construction activities associated with end uses and conveyance systems under the non-binding scenario would create potential for injury.	S
PUBLIC SERVICES AND UTILITIES	
No significant or potentially significant impacts were identified for public services and utilities .	
VISUAL RESOURCES	
Refined Alternative 4 Visual Impact 1 The construction and the presence of the Durango Pumping Plant and reservoir inlet conduit adjacent to the Animas River would detract from the scenic quality of the area and could be in conflict with City of Durango visual quality objectives.	S

Table 8 (continued)
Summary of Impacts for Refined Alternative 4 and Refined Alternative 6

Impact	Significance
Refined Alternative 4 Visual Impact 2 The construction and presence of Ridges Basin Dam and other physical components would alter the existing visual characteristics of the area and could detract from the future visual quality of the area.	S
Refined Alternative 4 Visual Impact 5 Development of project water end uses could detract from the scenic quality of the areas in which these facilities would be located.	PS
Refined Alternative 6 Visual Impact 4 Development of project water end uses could detract from the scenic quality of the areas in which these facilities would be located.	PS

10.0 PURPOSE AND NEED, RECOMMENDATIONS, AND ENVIRONMENTAL COMMITMENTS

10.1 INTRODUCTION

In the DSEIS Chapter 3, Affected Environment and Environmental Consequences, proposed structural and non-structural components and their potential environmental impacts and proposed mitigation measures for Refined Alternative 4 and Refined Alternative 6 of the Animas-La Plata Project (ALP Project) were discussed and evaluated. On the basis of this evaluation, Refined Alternative 6 was reassessed to determine whether the concerns raised during the development of alternatives process, summarized in DSEIS Chapter 2, about its ability to meet the project purpose and need have been addressed.

10.2 EXPLANATION OF PURPOSE AND NEED

Once again, the purpose and need for the proposed federal action is:

> *. . . to implement the [Colorado Ute Water Rights] Settlement Act by providing the Ute Tribes an assured long-term water supply and water acquisition fund in order to satisfy the Tribes' senior water rights claims as quantified in the Settlement Act, and to provide for identified M&I water needs in the Project area. [Federal Register Notice, January 4, 1999]*

In evaluating whether the purpose and need is satisfied by any particular alternative, it is necessary to determine whether it provides a feasible means by which the quantities of water contemplated in a settlement can be secured with sufficient certainty. In addition, the alternative must be reviewed to determine whether it will facilitate overall settlement implementation. The primary elements necessary to secure an Indian water rights settlement are as follows:

- An agreement by the United States, tribe, state, and a majority of parties to the adjudication, as well as associated legislation, which provides benefits (primarily water rights) to an Indian tribe sufficient to warrant a waiver of the tribe s reserved water rights claims;

- A defined and reasonable timeframe by which the tribe will, in fact, secure those benefits specified in the settlement agreement;

- Entry of a final decree by the court adjudicating the water rights claims which recognizes the tribe s right to the water and associated benefits identified in the settlement agreement; and

- A waiver of water rights claims by both the tribe and the United States, in its capacity as trustee, becoming effective. The waiver is contingent upon the three previous elements.

10.2.1 Purpose and Need Factors

In order to test an alternative against the project purpose and need, DSEIS identified four separate requirements. These requirements were utilized to evaluate the original 10 alternatives against the project purpose and need. The four requirements are described below:

- **Yield** - Will the alternative annually provide the desired volumes of wet water (i.e., water readily available for beneficial use) for the Ute Mountain Ute and Southern Ute Indian Tribe (Colorado Ute Tribes) in order to satisfy the Colorado Ute Tribes senior water rights claims, as well as other identified Indian and non-Indian users? The *purpose and need* describes an intent to implement the Colorado Ute Indian Water Rights Settlement Act of 1998 (Public Law (P.L.) 100-585) (Settlement Act), which contemplated an average water supply of 62,200 acre-feet/year (afy) (53,200 afy depletion) being made available to satisfy the Colorado Ute Tribes water rights claims in the Animas and La Plata River Basins.

- **Reliability** - Will the alternative provide a reliable, long-term water supply? Will the yield be renewed by the hydrologic cycle?

- **Location** - Will the water supply be reasonably available to the designated users on their lands and/or communities? Are needed water conveyance facilities feasible for development?

- **Practicability** - Is the development of the alternative technically feasible? Are there impediments or restrictions which make development of the alternative impractical? Some of these perceived impediments may be related to authority issues or legal concerns.

Following the evaluation described in the DSEIS, only 2 of the original 10 alternatives evaluated were determined to warrant additional study. These were Refined Alternative 4 and Refined Alternative 6. This decision was based, in part, on the fact that these two alternatives rated closely on impacts and both, in theory, could meet the purpose and need test. The DSEIS, however, did raise concerns about the ability of Refined Alternative 6 to ultimately meet the project purpose and need. Notwithstanding those concerns, because Refined Alternative 6 set forth a significantly different approach to potentially the meeting purpose and need of the project, the decision was made that a more in-depth analysis was needed. That analysis was done, and is contained in DSEIS.

In the course of performing the analysis on Refined Alternative 6, it became increasingly evident that under various scenarios, there are still significant issues associated with Refined Alternative 6 which

affect its ability to meet the project purpose and need. In particular, the analysis showed that there are concerns with the ability of Refined Alternative 6 to meet the ***yield*** criteria. There are also serious concerns about the ability of Refined Alternative 6 to meet the ***practicability*** criteria. These two concerns are discussed below.

10.2.1.1 Yield

As defined in the DSEIS, the purpose and need for this project is to implement the 1988 Settlement Act by providing an assured long-term water supply for the Colorado Ute Tribes and other project water users. Refined Alternative 4 includes a non-structural $40 million water acquisition fund to allow the Colorado Ute Tribes to purchase up to 13,000 afy of additional depletion water rights should they so choose. Alternative 6 was refined to provide for a similar fund to acquire an annual depletion of 13,000 af. It is assumed that this amount of water would be left on the land where acquired for the time being. For purposes of analysis, the relative impacts and potential reliability of this 13,000 afy component are assumed to be essentially the same for the two alternatives.

Additional water must be acquired under the remainder of the non-structural component of Refined Alternative 6 in order to meet the balance of the water supply needs of the Colorado Ute Tribes and other users. In comparison, under Refined Alternative 4 this additional water would be provided through structural components (e.g., Ridges Basin Reservoir). Refined Alternative 6, however, would supply this same amount of water from a combination of structural and non-structural components. In this respect, water from re-operation and modification of existing federal facilities in the project area would provide all but about 17,432 afy of the total project demand. The 17,432 afy balance would be met through a non-structural approach; it equates to about 11,933 acres of irrigated farmland that would have to be acquired in the project area. Of this amount, 10,000 acres would be acquired in the Pine River Basin out of a total non-Indian irrigated land base of 30,000 acres. Using the assumptions below, it appears feasible to acquire the remaining necessary acreages in the La Plata (785 acres), Mancos (500 acres), and McElmo (640 acres) drainages, which would provide water for 2,318 afy depletion. (The 11,933 acres is in addition to the acreage needed to acquire the 13,000 afy as discussed in the previous paragraph.)

Water rights must be acquired that, when considered in the aggregate, would represent the average water rights priority. The entire water rights base would be accessible to meet these needs, not just the senior rights. Although market forces are somewhat unpredictable, it appears feasible to acquire from 6,000 to 7,000 acres of land in the Pine River Basin which would require about 8,000 to 10,000 afy depletion on a willing seller/willing buyer basis within a 30-year planning horizon. The 30-year planning horizon is a conservative projection of the period over which land would be acquired; if land becomes available earlier, then the planning horizon could be reduced. As discussed below, however, it will become increasingly costly and difficult to acquire the last 5,000 to 7,000 afy of water in the Pine River Basin with sufficient senior water rights to meet the overall water needs. This would mean that the required depletion under Refined Alternative 6 would be about one-quarter less than the required amount. If the assumption of acquiring water rights with the average seniority is not met, then additional acreage would be required.

Real estate turn-over has been low over the last several years, at least where agricultural land is concerned. Since 1993, an average of about five properties per year (i.e., irrigated farm and ranch properties, with a minimum parcel size of 80 acres) in the Pine River Basin have been sold. The 1999 La Plata County active listings of farm and ranches in April 1999 totaled 37 properties, or 2 percent of all real estate listings; only 1 had sold in 1999 by that date.

There were 91 residential acreage listings in Bayfield, Ignacio, Vallecito, Mancos, and Cortez, of which 10 sold in this period. Only four of these listings were over 35 acres. However, past sales may not provide reliable forecast of future sales, particularly 30 years out. The sales price escalation that has been reported in the last few years is more of an indicator that shows a trend for higher prices on continuously smaller rural parcels.

Thus, it appears that under a willing buyer/willing seller principle, assuming a 30-year timeline, and given access to additional money if needed, sufficient land and water can potentially be acquired under Refined Alternative 6. However, as noted above, there is a certain element of risk involved in buying the last amount of land and water rights sufficient to meet the water needs for Refined Alternative 6. Risk will be represented either as additional cost to complete the land and water acquisition program, or the end result of acquiring fewer acres and acre-feet (af) of water than required. Because significant water acquisition is a critical element of Refined Alternative 6, uncertainty of its ability to meet the yield factor creates a potential fatal flaw to the ability of Refined Alternative 6 to secure the requisite benefits called for in the Settlement Act, and thus, its ability to meet the project s purpose and need. It should also be noted, as will be discussed below, that the 30-year planning horizon assumed here is a long time-period for implementation of an Indian water rights settlement.

On a comparable basis, the estimates for providing water to satisfy the Colorado Ute Tribes settlement can be met through both Refined Alternative 4 and Refined Alternative 6 at approximately the same cost as expressed in present value. Refined Alternative 4 has a present value of about $290.6 million (including the $40 million water acquisition fund; Navajo Nation Municipal Pipeline (NNMP); mitigation, and land purchases). Refined Alternative 6 has a present value of about $273 million (including a water acquisition fund; land purchases and water rights transfers; NNMP; enlarging Lemon Dam; and purchase of stored water in Red Mesa Reservoir). However, Refined Alternative 4 provides a secure, reliable water supply for municipal and industrial (M&I) purposes in a five-year period, while Refined Alternative 6 provides a secure, reliable water supply for only about three-quarters of the required amount, and a less reliable process of obtaining the remaining water needed through land acquisitions. There is a risk that Refined Alternative 6 could not meet the water supply of the Settlement Act, and this risk needs to be added to the present value of the total cost associated with it.

10.2.1.2 Practicability

In the process of evaluating impacts, several concerns arose about the practicability of Refined Alternative 6 in the areas of: (1) socioeconomic issues, (2) changes in water use, (3) timing, and (4) Indian Trust Assets (ITAs).

10.2.1.2.1 Socioeconomic Issues

There is a range of socioeconomic issues related to Refined Alternative 6 which affects its ability to meet the project purpose and need. These issues include a potential lack of support for a water acquisition program of the magnitude contemplated here, including the potential objections to taking land and water into trust.

With respect to the magnitude of land and water acquisition that is necessary as part of Refined Alternative 6, it would take roughly 11,933 acres of irrigated farmland out of a total of 156,000 irrigated acres in the 5 watersheds in order to obtain the amount needed to supply an assured water supply which represents the required non-structural portion of Refined Alternative 6. It should be reiterated here that this quantity has been reduced through the process of refining Alternative 6, whereby re-operation of existing federal facilities is utilized to make a substantial amount of water available to the Colorado Ute

Tribes. The yield provided through re-operation alone, however, does not achieve the quantity specified in the Settlement Act, and therefore, water acquisition is necessary. In addition, re-operation alone would create issues with respect to the location element of purpose and need if not combined with water acquisition. Notwithstanding the minimization of water acquisition as part of Refined Alternative 6, it is still significant enough to present an issue. While the amounts of land to be acquired on the La Plata, Mancos, and McElmo River Basins are minor in relation to the total amount of land available, the acquisition of potentially one out of every three acres of irrigated farmland on the Pine River could be disruptive to the local real estate market and the social fabric of the local community, and it could impact the county tax base as well. In fact, as evidenced by letters and comments submitted during the Romer-Schoettler process, there appears to be considerable local opposition to the types of land acquisition and water transfers proposed under Refined Alternative 6. Under a willing buyer/willing seller arrangement, this could present significant problems as to the practicability of Refined Alternative 6. Such opposition would certainly affect the ability of Refined Alternative 6 to meet the project purpose and need.

One specific factor in creating local opposition to Refined Alternative 6 is the prospect that land acquired as part of the process would be taken into trust by the federal government for the Colorado Ute Tribes benefit. Taking land into trust is a significant issue to local non-Indian communities due to the potential ramifications on the local sales and property tax base as well as jurisdictional matters (e.g. those involving law enforcement, land use planning, public education, and maintenance of utilities and roads). Conversely, having lands held in trust by the federal government is very beneficial to tribes from an economic, as well as cultural and social, perspective. The process by which lands are taken into trust are set forth in 25 CFR Part 151 (currently the subject of proposed new rules, published in the *Federal Register* on April 12, 1999 (64 FR 17574)). The process under both the existing and proposed rules provides for an administrative appeal process available to any party adversely affected by lands being taken into trust. Judicial review is then available. As a result, it is possible that some acquisitions may not result in land and associated water rights being taken into trust. Although this may not preclude Tribal use of water acquired as part of a voluntary sale, it does affect the nature of the rights the Tribes acquire, and limits those benefits contemplated as part of Refined Alternative 6.

The issues involved in acquiring the amounts of land and water from the local area that is deemed necessary as part of this particular settlement raises significant concerns as to the practicability of Refined Alternative 6 to satisfy the project purpose and need.

10.2.1.2.2 Changes in Water Use

All of the water rights acquired would be irrigation and not M&I rights. Thus, in order to change the type and place of use, applications must be made to the Colorado State Water Court. Such applications typically involve a long and burdensome judicial process undertaken in a public setting where any affected party would have the right to oppose. Based on discussions with professionals familiar with comparable water rights transfer cases in the State of Colorado, it is estimated that the average time needed to make the type of change of uses contemplated in Refined Alternative 6 would be approximately eight years per application (assuming several acquisitions included in each application). Applications must be supported by legal, engineering, environmental, and mitigation analyses, public forums, and legal representation. Current residents of eastern La Plata County and other project areas may well object to removing water from some of the best irrigated lands in the county, and to the implications to downstream return flows and impacts to groundwater recharge, which could affect their water supplies. If such objections occur, the change of use proceedings which would be necessary to utilize a significant amount of the acquired water would likely become expensive. In addition, the length of time and eventual outcome of the water transfer application would be uncertain. This process, therefore, adds elements of risk, uncertainty, and unquantified costs to the successful completion of the

non-structural components of Refined Alternative 6, which affects the practicability of the alternative and its ability to meet the purpose and need.

10.2.1.2.3 Timing

One of the elements which is critical to successful implementation of an Indian water rights settlement is a defined and reasonable time frame in which the tribes will secure those benefits specified in the settlement. Even with a reduced reliance on water acquisition, there are significant issues as to whether the level of water contemplated for acquisition under Refined Alternative 6 would indeed be available as discussed in the preceding sections. Even if available, the planning period utilized is a 30-year period. This presents a significant issue as to how this settlement could be finalized (i.e., the waiver of claims becoming effective) without the benefits of the settlement being secured for an extended time frame. This situation is exacerbated by the fact that, in and of itself, securing the benefits would be uncertain. Assuming sufficient support exists for utilization of Refined Alternative 6 as an alternative for settlement implementation, it presents a possibility that implementation of settlement could be initiated but never finished, resulting in the same situation 30 years from now that exists today. Accordingly, the extended timing with uncertain resolution related to Refined Alternative 6 calls into question its ability to satisfy the project purpose and need.

10.2.1.2.4 Indian Trust Assets

As a threshold matter, there is a question of whether Refined Alternative 6 would be an acceptable settlement alternative to the Colorado Ute Tribes (i.e., whether it would provide sufficient benefits with sufficient certainty to justify waiving their reserved water rights claims). Historically, the two Tribes have been resistant to a non-structural settlement alternative (Resolution No. 97-160 of the Southern Ute Tribe and Resolution No. 4365 of the Ute Mountain Ute Tribal Council). In addition, the federal government, as trustee for the Colorado Ute Tribes, must assess whether a settlement proposal justifies a waiver of the Tribes reserved water rights claims. Although refinements to Alternative 6 have increased the assured water supply which could be made available to the Colorado Ute Tribes for certain uses contemplated in the water use scenarios, there is still a considerable amount of uncertainty as to the ability of Refined Alternative 6 to finalize implementation. Consultation with the Colorado Ute Tribes would be necessary to conclusively assess their position on Refined Alternative 6.

At the same time, there is cause for significant concern regarding the impact of Refined Alternative 6 on the other two Indian tribes in the San Juan River Basin. As noted earlier, Refined Alternative 6 was refined to include re-operation of the federal facilities to make water available to the Colorado Ute Tribes. Although this improved the prospective yield of Refined Alternative 6, the result is that Refined Alternative 6 uses all the remaining available storage capacity in Navajo Reservoir beyond that required to meet existing approved depletions and to deliver water required for endangered fish, leaving no remaining flexibility to supply new depletions for the Jicarilla Apache Tribe or the Navajo Nation. Based on existing information, the impact to these future Indian trust water requirements is at least 8,000 afy greater than under Refined Alternative 4 and 20,000 afy greater than with the No Action Alternative. It is possible, though not yet modeled, that the impact might be greater if other uses contemplated by those tribes (e.g., Navajo-Gallup Project) are affected by reoperating Navajo Reservoir for the Colorado Ute Tribes settlement. The 8,000 afy increase in known impacts due to Refined Alternative 6 occurs as a result of using storage capacity of Navajo Reservoir to meet ALP Project demands at the expense of the demands anticipated to be supplied from Navajo Reservoir.

Impacts to the ability of the Navajo Nation and Jicarilla Apache Tribe to utilize their reserved water rights are significant to assessing the practicability of Refined Alternative 6. The United States is a

trustee to all four of the tribes in the basin and must seek to reconcile competing interests in a manner acceptable to each of the tribes. Although the Navajo Nation and Jicarilla Apache Tribe have historically not objected to the Colorado Ute Tribal settlement, the additional impacts caused by Refined Alternative 6 may cause those tribes to reassess their historical positions. Objections by those tribes would seriously affect the viability of Refined Alternative 6 to implement the Colorado Ute Tribes water rights settlement. Consultation would be necessary to conclusively assess those tribes position on Refined Alternative 6.

10.2.2 Conclusion

The evaluation of several factors reveals that implementation of Refined Alternative 6 presents a number of problems:

- It imposes significant risks on the ability of the project to provide an assured water supply commensurate with the water rights established in the settlement;
- The wholesale purchase of land and transfer of water may be opposed by the local community, thereby impacting completion of the settlement;
- It requires an extended and uncertain time frame to secure the settlement benefits which affects the ability to finalize the settlement; and
- It substantially impacts Indian trust water rights by using the remaining capacity of the Navajo Reservoir, a facility designed to supply these demands, thus creating a likely conflict with the Navajo Nation and Jicarilla Apache Tribe.

10.2.3 Clean Water Act Analysis

Reclamation is seeking an exemption under Section 404(r) of the Clean Water Act (CWA) from having to obtain a dredge and fill permit from the U.S. Army Corps of Engineers under Section 404(a) of the CWA. As part of this process, Reclamation has prepared an analysis of wetlands impacts under the guidance of Section 404(b)(1) of the Act. The guidelines under Section 404 provide that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed activity that would have a less adverse impact on the aquatic ecosystem. Such a practicable alternative can be any alternative which could be reasonably obtained, utilized, or expanded in order to fulfill the basic purpose of the activity.

Given that the basic purpose of the proposed federal action is to implement the Settlement Act by providing an assured long-term water supply to the Colorado Ute Tribes, the purpose and need analysis is also relevant to whether there are other practicable alternatives available that could fulfill the basic purpose of the activity under the Section 404(b)(1) standard. Based on the analysis in the DSEIS, Alternatives 1, 2, 7, 8, and 9 have been determined not to meet the practicability factor of the purpose and need test and are, therefore, not practicable under Section 404(b)(1). Alternative 5 fails the yield factor of the purpose and need test and is eliminated from further consideration. In addition, although Alternative 3 has been determined to meet the purpose and need test, its water quality concerns are significant enough to warrant its elimination from further consideration.

For the purpose of performing as thorough an analysis as possible, it is assumed that Refined Alternative 6 is capable of satisfying the project purpose and need, and is therefore practicable. This assumption

allows for Refined Alternative 6, along with Refined Alternative 4, to be evaluated pursuant to the CWA Section 404(b)(1) guidelines. That analysis is contained in the DSEIS.

10.3 RECOMMENDATIONS

The DSEIS concludes that Refined Alternative 4 would best meet the project purpose and need. In addition, it is also determined to be the least damaging and practicable alternative under the CWA analysis. Accordingly, Refined Alternative 4 is designated as Reclamation s Preferred Alternative. After reviewing agency and public comments and any additional analysis undertaken, it may be recommended to the Secretary of the Department of the Interior (Interior) for selection.

10.4 ENVIRONMENTAL COMMITMENTS

The environmental commitments that would be made by Interior or Reclamation during the development of Refined Alternative 4 (Reclamation s Preferred Alternative) are provided in the DSEIS. Reclamation would have shared responsibility for implementing measures that would avoid or reduce potential environmental impacts of the ALP Project. This responsibility would be shared with other federal agencies, the Colorado Ute Tribes, other ALP Project beneficiaries, as well as third-party entities which could include Colorado and New Mexico state agencies, local governments, and private developers.

The DSEIS describes commitments made during the planning process and incorporated into ALP Project design and mitigation measures proposed to reduce or avoid impacts that would otherwise occur as a result of the implementation of Refined Alternative 4. These commitments supersede commitments made by Reclamation in previous ALP Project National Environmental Policy Act (NEPA) documents.

The commitments described in the DSEIS would be implemented by Interior, or Interior would require their implementation by construction contractors, management authorities, or third-party developers. Commitments for pre-construction activities would generally be completed by Reclamation or by contractors during the final design process and prior to construction activities. Some commitments, such as monitoring or additional studies, would continue beyond completion of construction of structural facilities.

The non-structural component of Refined Alternative 4 (i.e., the $40 million water acquisition fund) would be administered by Interior through the Bureau of Indian Affairs (BIA). It was assumed that the use of this fund would be for acquisition of irrigated agricultural lands and that these lands would remain in irrigated production. In the event that the Colorado Ute Tribes were to elect to fund alternative activities with the Water Acquisition Fund or were to apply for water rights transfers, it would be the responsibility of the water acquisition fund s administering agency to determine appropriate environmental protection measures. It is possible that additional NEPA compliance may be required for such alternative uses.

The use of ALP Project water by either the Colorado Ute Tribes or other ALP Project beneficiaries would result in environmental impacts that would require the implementation of avoidance design specifications and mitigation measures. To the extent that Reclamation can require developers of ALP Project water end uses to implement environmental protection elements into design, Reclamation commits to requiring certain measures. However, all compliance responsibilities and costs associated with end use development would be the responsibility of the third-party developers. Additional NEPA compliance would likely be required for the development of end use facilities to occur. At such time, the

lead agency would be responsible for identifying additional environmental commitments specific to the proposed end uses.

10.4.1 General Commitments

Throughout the planning process for the project, efforts have been made to avoid impacts where practicable. If avoidance was not possible, then mitigation measures have been developed to reduce the level of impact. The mitigation measures for each resource impact are discussed in the DSEIS. In addition to the specific mitigation measures, other management practices would be employed during construction activities to minimize environmental effects and would be included in construction specifications. Many of these measures are required in order to comply with federal, state, or local laws and regulations, regardless of whether they are specifically identified in the report. Reclamation will comply with all relevant federal, state and local laws, ordinances, regulations, and standards during the implementation of Refined Alternative 4.

10.4.2 Water Resources and Hydrology Commitments

Reclamation will develop an operations plan for the Ridges Basin Pumping Plant that will schedule pumping from the Animas River in a manner to limit impacts to non-Colorado Ute Tribal entities ability to obtain water from the San Juan River as described under Mitigation for Refined Alternative 4 Hydrology Impact 2 in the DSEIS.

Reclamation will work with all appropriate state and federal agencies to pursue a method to protect ALP Project water return flows in the La Plata River drainage as a water supply for endangered fish as described under Mitigation for Refined Alternative 4 Hydrology Impact 3 in the DSEIS.

Reclamation will design and develop Ridges Basin Reservoir with a minimum pool establishment of 30,000 af.

10.4.3 Water Quality Commitments

Reclamation will develop and implement a program to reduce, minimize or eliminate temporary, short-term increases in suspended sediment loading or other water quality constituents, potentially caused by project construction, through the incorporation of permits, Best Management Practices (BMPs), and sediment control structures as described under Mitigation for Refined Alternative 4 Water Quality Impacts 1-3 in the DSEIS.

Reclamation will develop and implement a program designed to reduce, minimize or eliminate the temporary, short-term increases in suspended sediment loading that may potentially occur during construction of the non-binding end uses and water conveyance systems through requiring developers and construction contractors to incorporate BMPs and sediment control devices as described under Mitigation for Refined Alternative 4 Water Quality Impact 6 in the DSEIS.

10.4.4 Vegetation Commitments

Reclamation will replace approximately 1,549 acres of upland habitat lost from the construction of the Ridges Basin Reservoir and the Durango Pumping Plant in order to replace or exceed the habitat value of the lost vegetation as described under Mitigation for Refined Alternative 4 Vegetation Impacts 1 and 2 in the DSEIS. The replacement/acquisition of lost habitat will be completed prior to initiation of ground-

breaking construction activities at the reservoir and pumping plant. Reclamation will attempt to acquire large contiguous acreage and will attempt to acquire these lands first in the river basins that would be affected by the ALP Project, and then outside of those basins, with the final decision made in consultation with state and federal wildlife agencies.

Reclamation will compensate the loss of 134 acres of wetland/riparian habitat at a mitigation ratio sufficient to replace or exceed the habitat value of wetland/riparian habitat lost as described under Mitigation for Refined Alternative 4 Vegetation Impacts 3 and 4 in the DSEIS. Reclamation will replace lost wetland/riparian areas at a ratio of 1.5:1, thus creating approximately 200 acres of replacement wetlands. Mitigation will involve a program of land acquisition, wetland development, and long-term management. To the extent possible, this program will be integrated into the wildlife habitat mitigation program to expand benefits and provide large blocks of contiguous wildlife habitat. For purposes of this DSEIS, it is assumed 600 acres will be necessary. Because of limited water supplies for new wetland creation in the region, restoration of degraded wetlands would be an important component of any wetland plan. As with wildlife habitat mitigation, the La Plata River Basin would be given first priority for wetland development.

Reclamation will ensure that construction contractors limit ground disturbance to the smallest feasible areas, and will ensure that construction contractors implement BMPs, along with the planting or re-seeding disturbed areas using native plant species to assist in the re-establishment of native vegetation as described under Mitigation for Refined Alternative 4 Vegetation Impact 5 in the DSEIS.

Reclamation will require that development of non-binding end uses avoids or minimizes construction impacts to wetland and riparian vegetation located within corridor alignments of the non-binding water conveyance pipelines. Reclamation will require that construction zones are kept to the minimum size needed to meet project objectives. If avoidance is not possible, a riparian/wetland mitigation and monitoring plan will be developed to compensate for the loss of vegetation cover as described under Mitigation for Refined Alternative 4 Vegetation Impact 8 in the DSEIS.

10.4.5 Wildlife Commitments

Reclamation will mitigate the direct and indirect loss of approximately 3,000 acres of wildlife habitat through the purchase, development, and management of approximately 3,000 acres of suitable land as described under Mitigation for Refined Alternative 4 Wildlife Impact 1 in the DSEIS. The actual amount of land that would be acquired to obtain this level of mitigation would depend on the potential wildlife value of the lands acquired. All reasonable attempts will be made to acquire interests in lands on a willing seller basis, using fee simple purchases, conservation easements, purchase options, or life estates, to name a few. However, this does not preclude the use of other authorities available to acquire such land interests. Priority will be given to lands in the La Plata River drainage, as well as in the vicinity of Ridges Basin, to provide replacement habitat for displaced deer, elk, and other wildlife that utilize Ridges Basin and adjacent areas that would be affected. Large, contiguous parcels would be given priority to create unfragmented habitat and to facilitate management. Lands will be managed for wildlife and other uses would not be allowed if it is determined that they would interfere with the wildlife habitat benefits. Acquisition, development, and management plans will be coordinated with the U.S. Fish and Wildlife Service (Service), Colorado Department of Wildlife (CDOW), and possibly the Southern Ute Indian Tribe. Because of the preference to acquire interests in lands on a willing seller basis, it is recognized that the specific parcel location is difficult to establish at this time. If La Plata or Ridges Basin areas are unavailable, lands in other areas of the San Juan River Basin will be sought. Based on similar past programs, it would be feasible to acquire the lands; however, it should be noted that they may not be in the immediate project impact area.

Reclamation will develop construction specifications to include noise, traffic, and human use restrictions to minimize disturbance to wildlife near the construction zone of Ridges Basin as described under Mitigation for Refined Alternative 4 Wildlife Impact 2 in the DSEIS. The Carbon Mountain gas pipeline route, which could significantly impact golden eagle nesting, will not be considered. Reclamation will make efforts to avoid construction during the May-July period in the vicinity of elk calving areas to minimize impacts to elk.

Reclamation will ensure that recreational facilities and the new alignment for County Road (CR) 211 are sited or restricted in such a way to minimize the disruption of deer and elk habitat utilization and behavior as described under Mitigation for Refined Alternative 4 Wildlife Impact 3 in the DSEIS. Habitat impacts discussed previously include indirect impacts. In addition, the operation of those facilities would be managed through a plan that would support the minimization or elimination of those conflicts/impacts. Recreation facilities will not be permitted on the west or south sides of the reservoir to reduce impacts to big game migration corridors. Sufficient land will be acquired at the time reservoir right-of-way is acquired at the upper (western) end of the reservoir and along the southern shore to provide a wildlife migration corridor.

Reclamation will collaborate with raptor specialists from the Service and CDOW on road realignment and construction activities at Ridges Basin Dam to identify and implement measures minimizing effects on existing golden eagles and their nests on Carbon Mountain as described under Mitigation for Refined Alternative 4 Wildlife Impact 4. All reasonable means to preclude human activity on Carbon Mountain will be pursued. All power lines will be designed raptor-proof.

Reclamation will require that a 0.25-mile buffer around the existing golden eagle nests be identified and that all reasonable measures are pursued to preclude human activity on Carbon Mountain during the nesting period of golden eagles (December 1 through July 15), as described under Mitigation for Refined Alternative 4 Wildlife Impact 5 in the DSEIS.

Reclamation will ensure that development of non-binding end uses and conveyance systems avoid or minimize construction impacts to wetland and riparian vegetation wildlife habitat located within the potential corridor alignments of the non-binding water conveyance pipelines and that construction zones are the minimal necessary to meet project objectives as described under Mitigation for Refined Alternative 4 Wildlife Impact 7 in the DSEIS. If avoidance is not possible, Reclamation will require that a riparian/wetland habitat mitigation and a monitoring plan is developed to compensate for the loss of habitat value.

10.4.6 Aquatic Resources Commitments

Reclamation will evaluate the feasibility of extending the inlet conduit for water to enter the reservoir below the thermocline in Ridges Basin Reservoir as described under Mitigation for Refined Alternative 4 Aquatics Resources Impact 2 in the DSEIS. Final determination of the inlet conduit design will be dependent upon findings of this evaluation.

Reclamation will develop and implement a monitoring program at Ridges Basin Reservoir to determine the extent of bioaccumulation of trace elements in fish and wildlife within the area. The monitoring program will be initiated within one year after the reservoir is filled and the coldwater fishery is established. The monitoring study will be conducted annually for a minimum of three years, as described under mitigation for Refined Alternative 4 Aquatic Resources Impact 3 in the DSEIS.

Reclamation will continue to monitor native fisheries in the Animas River and will evaluate several methods of compensation for impacts, including modifying pumping operation, providing fish passage around migration barriers on the Animas River, and providing and protecting ALP Project water in the La Plata River as described under Mitigation for Refined Alternative 4 Aquatic Resources Impact 4 in the DSEIS.

Reclamation will review and adopt established guidelines for screening diversion facilities to minimize fish entrainment and impingement at the Ridges Basin Pumping Plant. Reclamation will also ensure that design specifications include Best Available Technologies as described under Mitigation for Refined Alternative 4 Aquatic Resources Impact 5 in the DSEIS.

Reclamation will operate the pumping plant in a manner to minimize the downstream stranding of fish in the Animas River. Changes in pumping rate will not exceed 50 cubic feet per second (cfs)/hour upramp and 100 cfs/hour downramp as described under Mitigation for Refined Alternative 4 Aquatic Resources Impact 6 in the DSEIS.

Reclamation will either screen or implement other physical structures to prevent live fish from being released from Ridges Basin Reservoir. The reservoir outlet system will be designed and fitted with devices to eliminate survival of fish escaping the reservoir. Reclamation will monitor escapement from the reservoir and Basin Creek as described under mitigation for Refined Alternative 4 Aquatic Resources Impact 7 in the DSEIS.

Reclamation will fund the acquisition and stocking of wild strains of trout annually in the Animas River within the boundaries of the Southern Ute Indian Reservation to compensate for fish loss due to the reduction in usable trout habitat. Individual stocks of trout will be marked in such a manner that age groups could be monitored over time. This monitoring plan would be developed in consultation with the Service, CDOW, New Mexico Department of Game and Fish (NMDGF), and the Tribe. This relative success of this effort will be assessed after four years. If it is deemed a success; that is, if the trout biomass within the stocked reaches of the river are elevated to a point of supporting a recreational fishery, the stocking program will continue. For the acquisition of trout stock, Reclamation will consider the development of a new hatchery in cooperation with the Southern Ute Indian Tribe and others. This same hatchery could very well be utilized for providing for fish stocking for Ridges Basin Reservoir.

10.4.7 Special Status Species Commitments

Reclamation will implement conservation recommendations in the 1996 Biological Opinion, with modifications, including the incorporation of bypass flows to reduce the possibility of impacts to cottonwood recruitment as described under Mitigation for Refined Alternative 4 Special Status Species Impact 1 in the DSEIS.

Reclamation will, in conjunction with the Service, CDOW, NMDGF, and the Colorado Ute Tribes, implement a terrestrial and aquatic monitoring program to determine potential water contamination affects and ways to address potential contaminant issues as described under Mitigation for Refined Alternative 4 Special Status Species Impact 2 in the DSEIS.

Reclamation will ensure that contractors schedule construction of the NNMP to avoid construction during periods when the southwestern willow flycatcher is present near San Juan River crossing as described under Mitigation for Refined Alternative 4 Special Status Species Impact 3 in the DSEIS.

Reclamation will operate Navajo Reservoir and Ridges Basin Reservoir to mimic the natural hydrograph flows of the San Juan River for the benefit of the Colorado pikeminnow and razorback sucker as described under Mitigation for Refined Alternative 4 Special Status Species Impact 4 in the DSEIS.

Reclamation will design and operate the Ridges Basin Reservoir outlet system to eliminate the possibility of predatory or competitive fish escaping the reservoir and releasing into the Animas River as discussed under Mitigation for Refined Alternative 4 Special Status Species Impact 5 in the DSEIS.

10.4.8 Geology and Soils Commitments

Reclamation will reduce or eliminate the potential for earthquake damage to project facilities through specific design specifications. Specifications will require design performance to withstand a maximum credible earthquake for seismic sources in the vicinity of Ridges Basin Dam site as described under Mitigation for Refined Alternative 4 Geology Impact 1 in the DSEIS.

Reclamation will develop and implement a controlled water rate program for filling Ridges Basin Reservoir to reduce the potential for induced seismic impacts as described under Mitigation for Refined Alternative 4 Geology Impact 2 in the DSEIS.

Reclamation will develop and implement a facilities operation program that includes monitoring the reservoir shoreline and slopes for landslide and slumping. Reclamation will also provide for public notification and control public access in areas where high landslide and slumping potential exists as described under Mitigation for Refined Alternative 4 Geology Impact 3 in the DSEIS.

Reclamation will develop an engineered process plan to limit, control, and manage dam site methane gas releases during construction. Reclamation will also monitor the area for methane gas releases during construction and operation as described under Mitigation for Refined Alternative 4 Geology Impact 4 in the DSEIS.

Reclamation will investigate the potential of gas release due to man-made intrusions within Ridges Basin and the proposed dam site. Specifically, construction investigations will study the integrity of abandoned exploration wells and the Gates Coal Mine as described under Mitigation for Refined Alternative 4 Geology Impact 5 in the DSEIS.

Reclamation will mandate that construction contractors use and implement measures contained in erosion control guidelines and BMPs to control soil erosion from construction areas as described under Mitigation for Refined Alternative 4 Soils Impact in the DSEIS.

Reclamation will develop and implement a program to control reservoir filling and drawdown at rates sufficient to reduce significant erosion and sedimentation potential as described under Mitigation for Refined Alternative 4 Soils Impact 2 in the DSEIS.

10.4.9 Cultural and Paleontologic Resources Commitments

Reclamation will ensure compliance with historic/archaeological treatment measures and publish results pursuant to the Programmatic Agreement developed in conjunction with the ALP Project as described under Mitigation for Refined Alternative 4 Cultural Impacts 1-3.

Reclamation will ensure compliance with mitigation measures developed in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA) and Executive Order 13007 as described under Mitigation for Refined Alternative 4 Cultural Impact 4.

Reclamation will ensure that areas to be disturbed are field surveyed prior to construction disturbance and will ensure that construction monitoring is conducted where deemed appropriate as described under Mitigation for Refined Alternative 4 Paleontologic Impact 1 in the DSEIS.

Reclamation will ensure that periodic shoreline monitoring is conducted as part of the facilities operations plan as described under Mitigation for Refined Alternative 4 Paleontologic Impact 2 in the DSEIS.

10.4.10 Agriculture Commitments

No environmental commitments are made for agricultural resources.

10.4.11 Recreation Commitments

Reclamation will pursue pumping regimes that reduce adverse flow effects on boating opportunities within the Animas River when possible and will take steps to improve public access to the river as described under Mitigation for Refined Alternative 4 Recreation Impacts 1 and 2 in the DSEIS.

Reclamation will alter pumping regimes during periods of competitive events as described under Mitigation for Refined Alternative 4 Impact 3 in the DSEIS.

Reclamation will acquire or provide funding (not to exceed $500,000) for the acquisition of public access at a minimum of two points on the Animas River between the High Bridge and Basin Creek to reduce effects to anglers on the Animas River as described under Mitigation for Refined Alternative 4 Recreation Impact 4 in the DSEIS.

10.4.12 Socioeconomics Commitments

No environmental commitments are made for socioeconomic resources.

10.4.13 Land Use Commitments

No environmental commitments are made for land use impacts.

10.4.14 Hazardous Materials Commitments

Reclamation will ensure that the Durango Pumping Plant is designed to minimize the disturbance of contaminated materials. Reclamation will also ensure that procedures are developed for radiological monitoring of excavated soils and groundwater encountered and that remedial procedures are planned in advance to counteract the potential for human exposure and prevention of contaminated groundwater release from the construction site as described under Mitigation for Refined Alternative 4 Hazardous Materials Impact 1 in the DSEIS.

Reclamation will ensure that all federal and state requirements pertaining to the management and handling of hazardous materials and radioactive waste are followed and will include those requirements

within construction contract language inclusive of construction safety and environmental compliance as described under mitigation for Refined Alternative 4 Hazardous Materials Impact 2 in the DSEIS.

Reclamation will require that preconstruction surveys are conducted for non-binding water end use facilities and conveyance system development and that hazardous material standards relating to construction are adhered to as described under Mitigation for Refined Alternative 4 Hazardous Materials Impact 5 in the DSEIS.

10.4.15 Transportation Commitments

Reclamation will conduct a transportation survey prior to construction of Ridges Basin Dam and Reservoir and will implement methods to reduce traffic-related impacts as described under Mitigation for Refined Alternative 4 Transportation Impacts 1 and 2 in the DSEIS.

Reclamation will ensure through construction design to maintain CR 211 roadway, shoulder, drainage, and roadside to standards adequate to avoid noticeable degradation as described under Mitigation for Refined Alternative 4 Transportation Impact 3 in the DSEIS.

Reclamation will require third-party developers of recreation facilities at Ridges Basin Reservoir to conduct traffic engineering impacts analysis studies and to mitigate recreation facility impacts according to state and county standards. Associated costs would be the responsibility of the developing entity as described under Mitigation for Refined Alternative 4 Transportation Impact 7 in the DSEIS.

10.4.16 Air Quality Commitments

Reclamation will require that construction contractors implement measures to control fugitive dust and exhaust emissions during construction as described under Mitigation for Refined Alternative 4 Air Quality Impact 1 in the DSEIS.

Reclamation, or other responsible federal agency, will require third-arty developers to implement measures to control fugitive dust and other emissions during construction and operation of non-binding end uses.

10.4.17 Noise Commitments

Reclamation will require that the Durango Pumping Plant construction contractor restrict operation of heavy equipment during the nighttime hours as described under Mitigation for Refined Alternative 4 Noise Impact 1 in the DSEIS.

Reclamation will ensure that construction contractors provide blasting notification to residents, sound pre-blast alarms, and follow the construction safety plan as described under Mitigation for Refined Alternative 4 Noise Impact 2 in the DSEIS.

Reclamation will design the Durango Pumping Plant with sound insulation and vegetative screening as described under Mitigation for Refined Alternative 4 Noise Impact 3 in the DSEIS.

Reclamation will ensure that construction contractors schedule construction activities to avoid or minimize loud activities in the vicinity of golden eagle nesting areas during the nesting season and that

nesting areas are off limits to construction forces and visitors as described under Mitigation for Refined Alternative 4 Noise Impact 4 in the DSEIS.

Reclamation will require that third-party developers of recreation facilities at Ridges Basin Reservoir incorporate in a recreation development/management plan the requirement to prohibit particularly loud forms of watercraft and include signing to advise people of eagle nesting sensitivity to human presence and noise as described under Mitigation for Refined Alternative 4 Noise Impact 5 in the DSEIS.

Reclamation will ensure that developers and contractors associated with construction and operation of the non-binding end uses incorporate methods to minimize noise disturbances as described under Mitigation for Refined Alternative 4 Noise Impact 6 in the DSEIS.

10.4.18 Public Health and Safety Commitments

Reclamation will ensure that public access to structural component construction areas will be controlled by signage and by fencing around construction areas as described under Mitigation for Refined Alternative 4 Public Health and Safety Impact 1 in the DSEIS.

Reclamation will ensure that contractors configure haul routes and access roads to prevent or discourage public vehicular entry, including placement of signs warning against entry as described under Mitigation for Refined Alternative 4 Public Health and Safety Impact 2 in the DSEIS.

Reclamation will ensure that all the potentially affected gas companies will be contacted prior to construction crossings of gas pipelines which will be precisely located and appropriately marked in the field and on the specifications as described under Mitigation for Refined Alternative 4 Public Health and Safety Impact 3 in the DSEIS.

Reclamation will ensure that public access to end use and delivery system construction areas is controlled by signage and by fencing around construction areas as described under Mitigation for Refined Alternative 4 Public Health and Safety Impact 4 in the DSEIS.

Reclamation will ensure that recreation area planning, final design of facilities, and reservoir access points are developed to promote safety and accident management techniques as described under Mitigation for Refined Alternative 4 Public Health and Safety Impact 7 in the DSEIS.

10.4.19 Public Services and Utilities Commitments

Reclamation will ensure that construction contractors adequately secure and patrol their work sites as described under Mitigation for Refined Alternative 4 Public Services and Utilities Impact 1 in the DSEIS.

Reclamation will ensure that contractors will mark the locations of existing buried utilities and develop a notification system for coordination with affected utilities during construction as described under Mitigation for Refined Alternative 4 Public Services Utilities Impact 4 in the DSEIS.

10.4.20 Visual Resources Commitments

Reclamation will ensure that as part of construction design, the Durango Pumping Plant blends into the natural landform and that, following construction, the site is adequately revegetated as described under Mitigation for Refined Alternative 4 Visual Impact 1 in the DSEIS.

Reclamation will ensure that the design of structural facilities incorporates, to the extent practicable, non-intrusive design elements and that restoration of disturbed areas be conducted as described under Mitigation for Refined Alternative 4 Visual Impact 2 in the DSEIS.

10.4.21 Indian Trust Assets and Environmental Justice

Interior will support the modification of the Settlement Agreement, through legislated amendments to the Settlement Act, to recognize the new limits placed on the use and amount of water provided to the Colorado Ute Tribes and establishment of the water acquisition fund.

Interior will pursue the development of operation plans for Ridges Basin and Navajo Reservoirs that would optimize more efficient delivery of the flow recommendations for endangered fish in the San Juan River and limit certain project pumping to allow for making additional depletions and developable water available for other Indian tribes present and future water needs.

Interior will facilitate discussions between the Jicarilla Apache Tribe and other parties with interest in the San Juan River Basin to develop options of obtaining 25,500 afy depletion as authorized under the Jicarilla Apache Tribe Water Rights Settlement Act.

11.0 OTHER IMPACT CONSIDERATIONS

The 1996 FSFES contained information on several connected, cumulative, and related actions and is incorporated by reference to the DSEIS. Connected actions addressed in the 1996 FSFES included the SJRBRIP and the Navajo Unit of the Colorado River Storage Project. Cumulative and related actions included the Navajo Unit; the Dolores Project; the Pine River, Florida, and Mancos Projects; the Navajo Indian Irrigation Project (NIIP), the Uranium Mill Tailings Remedial Action Project, and the Colorado River Basin Salinity Control Program.

The DSEIS includes updated information regarding Navajo Reservoir as a connected action. Also included is information about cumulative actions that were not addressed in the 1996 FSFES, namely, the NIIP, Jicarilla Apache Tribe Water Rights Settlement, the proposed Navajo-Gallup Water Supply Project (Navajo-Gallup Project), the completion of the Hogback Project, the Pine River Irrigation District M&I Conversion Project (PRIIP), and various Colorado transportation improvement projects.

11.1 Relationship of Operation of Navajo Reservoir to the ALP Project

Connected closely to any new operation scenario for Navajo Dam are the developments on tributary streams to the San Juan River. One of these streams is the Animas River which originates in Colorado and empties into the San Juan River at Farmington, New Mexico.

The initial catalyst for considering a change in the operations of Navajo Dam occurred in consultations under the ESA Section 7 consultation in connection with proposed construction of the ALP Project. A draft Biological Opinion on the ALP Project, dated May 7, 1990, concluded that the construction of the project would jeopardize the continued existence of an endangered species--the Colorado pikeminnow. During this time, new hydrological investigations suggested that additional flexibility would exist in the operation of Navajo Dam to help offset the negative impacts of constructing the project. By reducing late-fall and winter releases, water could be made available to increase spring peaks and return the San Juan River to a more natural hydrograph that would mimic pre-dam historic flow conditions. This flexibility in flow patterns would assist in developing an RPA for implementation of ALP Project that

would protect the Colorado pikeminnow and allow initial ALP Project construction efforts to move forward. Subsequently, a RPA was developed that required operation of Navajo Dam to mimic a natural hydrograph for the life of the ALP Project. The RPA was included in the October 25, 1991 Final Biological Opinion from the Service. Since no natural hydrograph has been defined or developed for the San Juan River, the RPA also included a commitment to help finance approximately seven years of research to determine the flow requirements for the endangered Colorado pikeminnow and razorback sucker (a candidate species at that time). Under the direction of the SJRBRIP Biology Committee, test releases were conducted and evaluated during the 1992-1998 research period. In exchange for this commitment, Phase I, Stage A of the ALP was approved, with a net depletion of 57,100 afy.

Subsequent to the release of the May 7, 1990 Draft Biological Opinion, Reclamation requested initiation of Section 7 consultation on the operations of Navajo Dam in a memorandum to the Service dated July 30, 1991. In that memorandum, Reclamation committed to operate Navajo Dam in concert with ongoing research to determine hydrologic conditions for fish and, thereafter, to operate Navajo Dam in the manner most consistent with endangered fish recovery for the life of Navajo Dam. It was also recognized that Reclamation would produce the necessary documents to comply with NEPA on any recommended changes to the operating criteria for Navajo Dam. On August 19, 1991, the Service concurred with Reclamation's request and extended the consultation period to allow completion of the research.

On February 26, 1996, a second Final Biological Opinion concerning critical habitat of the native endangered fish species placed further restrictions on the allowable depletion. The opinion concluded that the depletion of 57,100 afy could not be exceeded in any one year until all the elements of the RPA were completed and/or implemented. This limitation was waived in the event that Reclamation lowered winter releases from Navajo Dam and Reservoir to 300 cfs to provide the extra flexibility in releases described in the hydrology section of the 1991 Biological Opinion. If that condition existed, then the ALP Project could maintain an average annual depletion of 57,100 afy.

A seven-year research period for the SJRBRIP resulting from consultation under the ESA was completed in 1998. In May 1999, the SJRBRIP Biology Committee provided flow recommendations for the San Juan River to assist in the recovery of endangered fish. These flow recommendations require approval of the Service and Reclamation before being implemented.

11.2 Navajo Operation Environmental Impact Statement

On October 29, 1996, Reclamation agreed under terms of a legal settlement with the San Juan Fly Fishing Federation, to prepare an environmental impact statement (EIS) before initiating any permanent change in the operations at Navajo Dam under the SJRBRIP, and to complete compliance with NEPA before reducing flows below 500 cfs in the future.

Public scoping meetings on the operation of Navajo Dam and Reservoir took place during November 1999. A draft of the EIS is scheduled for the fall of 2000 at which time public hearings will be held. The final EIS would be completed during the spring or early summer of 2001.

11.3 Indian Trust Assets

The United States has a trust responsibility to protect and maintain rights reserved by or granted to American Indian Tribes or by Indian individuals by treaty, statutes and executive orders. This trust responsibility requires that agencies such as Reclamation take actions reasonably necessary to protect ITAs. The Reclamation ITA policy states that Reclamation will carry on its activities in a manner which

protects ITAs and avoids adverse impacts when possible. When Reclamation cannot avoid adverse impacts, it will provide appropriate mitigation or compensation.

ITAs have been identified for the federally recognized tribes within the Upper San Juan River, including: Southern Ute Indian Tribe, Ute Mountain Ute Tribe, Jicarilla Apache Tribe, and Navajo Nation. ITAs were examined in the 1996 FSFES. Because the affected environment for several ITAs has changed little since the writing of that document, information from that report is used where appropriate, and updated as necessary.

Five types of ITAs that would potentially be impacted by the project are examined in the DSEIS: water rights, trust lands, mineral rights, hunting and fishing rights, and cultural resources on trust lands. The four tribes are examined independently. Cultural resource issues and mitigation, including sacred sites and NAGPRA issues, are addressed in the DSEIS.

11.4 Environmental Justice

Environmental Justice issues were identified and reviewed simultaneously with the review of ITAs. Executive Order 12898, dated February 11, 1994, established the requirement to address Environmental Justice concerns within the context of agency operations.

> *To the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health and environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States.*

As part of the NEPA process, agencies are required to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income communities. The Executive Order on Environmental Justice requires that the responsibilities set forth shall apply equally to Native American programs. Therefore, when minority and low-income populations are discussed, Indian populations may also be included.

Whereas ITAs deal primarily with Indian lands and natural resources, environmental justice includes any adverse affect on minority and low-income populations in the analysis area and may include Indian populations as well. Key indicators reviewed for environmental justice include income, poverty rates, and the minority population within a community. Because the ALP Project is a water resource project, Environmental Justice also included a review of the availability of domestic water to minority and low-income households.

Environmental Justice concerns were evaluated for the Southern Ute Indian Tribe, Ute Mountain Ute Tribe, Navajo Nation, and Jicarilla Apache Tribe. In addition, other tribes with cultural resource ties to the project area were also included in the evaluation.

12.0 PUBLIC INVOLVEMENT ACTIVITIES

During 1999, Reclamation used several methods to obtain public input on the modified ALP Project, including scoping meetings and dissemination of public information via project newsletters and a project website.

12.1 Public Scoping Process

In January 1999, Reclamation announced its intention to prepare a supplement to the 1996 FSFES. A NOI was published in the *Federal Register* on January 4, 1999. The NOI was sent to approximately 800 interested parties including federal, state, and local officials; agency representatives; conservation organizations; local libraries and newspapers; interveners in Reclamation proceedings; and property owners adjacent to the proposed ALP Project.

The NOI also announced that a series of scoping meetings would be conducted in February 1999 to receive public input on issues to be addressed in the DSEIS. The scoping meetings were held on February 2, 3, and 4, 1999 at the times and locations listed below. In addition to the announcement contained in the January 4, 1999 *Federal Register*, each meeting was publicly noticed approximately 30 days in advance of its scheduled date. Advertisements were placed in local newspapers and radio stations as well.

- February 2, 1999: 6:00 p.m., Double Tree Hotel, Durango, Colorado
- February 3, 1999: 6:00 p.m., San Juan College, Farmington, New Mexico
- February 4, 1999: 6:00 p.m., Denver Convention Center, Denver, Colorado

Approximately 275 people attended the Durango meeting; 100 people attended the meeting in Farmington; and close to 50 persons attended the meeting in Denver. A total of 99 oral comments were received during the scoping meetings. Transcripts of the meetings were made and are part of the public record for the ALP Project. Interested or affected individuals, organizations, and agencies were also encouraged to submit written comments to Reclamation by February 19, 1999, to most effectively be considered. Reclamation received approximately 135 letters during the comment period and additional letters were received following the close of the comment period. Each of the written and oral statements from the scoping meetings was evaluated by Reclamation and, to the extent feasible, incorporated and/or acknowledged in the DSEIS.

12.2 Project Newsletters

Reclamation's public involvement activities have also included preparation and distribution of a series of newsletters intended to provide up-to-date information on the ALP Project environmental review process. To date, two newsletters have been sent to over 800 individuals, agencies, and organizations. The first newsletter, published in June 1999, presented an overview of the ALP Project environmental review process for implementing the Settlement Agreement and also provided a summary of the February 1999 scoping meetings. The second newsletter, published in late September 1999, described the process being used to evaluate the various ALP Project alternatives and included brief summaries of each alternative. Additional newsletters will be published in upcoming months in parallel with key project milestones.

12.3 Project Website

In addition to the newsletters, Reclamation established a new link to its existing web page (located at www.uc.usbr.gov) to provide information on the ALP Project. The new site provides current information on the project s environmental review process and includes copies of the published newsletters, a more detailed description of each of the alternatives, a project schedule and time line, and a site map. Interested parties can also download an electronic version of the DSEIS and will be able to provide comments on the document via e-mail during the 60-day public comment period.

13.0 CONSULTATION AND COORDINATION PROCESS

As the lead agency responsible for preparation of the DSEIS, Reclamation used an inter-disciplinary team of consulting resource specialists to prepare the document, including the Colorado Ute Tribes, and their staff and consultants. In addition, several other federal, state, and local agencies participated with the interdisciplinary team during preparation of the DSEIS. **Table 9** provides a list of those agencies with jurisdictional authority, interest, or expertise in the activities or issues addressed in the ALP Project DSEIS.

Table 9
Agencies and Organizations that Participated in the ALP Project Consultation and Coordination Process

Federal Agencies
Department of the Interior
Bureau of Reclamation
Environmental Protection Agency
Fish and Wildlife Service
Bureau of Indian Affairs
Army Corps of Engineers
Bureau of Land Management
Department of Energy, Western Area Power Administration

State of Colorado Agencies
Division of Wildlife
Water Conservation Board
Department of Natural Resources
State Department of Agriculture
State Engineer s Office
Department of Transportation

State of New Mexico Agencies
Department of Game and Fish
Energy, Minerals, and Natural Resources Department
Environmental Department
Interstate Stream Commission
State Engineer s Office
State Land Office

Indian Tribes
Southern Ute Indian Tribe
Ute Mountain Ute Tribe
Navajo Nation
Jicarilla Apache Tribe

Local Agencies
Animas-La Plata Water Conservancy District
San Juan Water Commission
City of Durango, Colorado

Interagency/intergovernmental coordination and consultation is an essential part of the EIS process. It provides a forum in which close working relationships are developed with agencies and organizations that are affected by or concerned about a proposed project. Similar to the public scoping process, a key objective of a consultation and coordination program is to provide an opportunity for agencies and organizations to participate in the investigation of project alternatives and provide input about specific project-related issues.

In June 1999, Reclamation and the EPA entered into a cooperating agency agreement regarding preparation of the ALP Project DSEIS. The agreement outlined EPA and Reclamation's responsibilities, which included working together to reach agreement on the content on the SEIS. However, EPA s participation as a cooperating agency does not necessarily represent agreement with Reclamation on the issues addressed in the DSEIS.

Reclamation and the Service have consulted, both formally and informally, regarding potential impacts to protected species which may occur as a result of development and operation of the proposed ALP Project. Fish and wildlife impacts and mitigation measures discussed in the DSEIS are based on Reclamation s initial consultation with the Service. A Biological Assessment has been prepared by Reclamation and was submitted to the Service in December 1999. The final Biological Opinion on the ALP Project will be included in the Final SEIS. A Fish and Wildlife Coordination Act Report is also being prepared by the Service and its findings will be included in the Final SEIS as well.

Reclamation has coordinated with EPA regarding potential ALP Project effects on wetlands and water quality and with EPA and the U.S. Army Corps of Engineers on consideration of the Section 404(b)(1) guidelines.

Pursuant to the draft NAGPRA, Reclamation has consulted with interested and concerned Indian Tribes. Tribal representatives included elected officials, recognized traditional and religious leaders, Tribal representatives and historians, and cultural committees. In addition, a draft NAGPRA plan has been prepared for the ALP Project. The Plan has been prepared with regard to potential ALP Project effects on Native American human remains, associated grave goods, and objects of cultural patrimony. A draft Programmatic Agreement has also been prepared pursuant to the National Historic Preservation Act.

List of Acronyms

1980 FES	1980 Final Environmental Statement (INT FES 80-18)
1992 DSFES	1992 Draft Supplement to the 1980 Final Environmental Statement
1996 FSFES	1996 Final Supplement to the 1980 Final Environmental Statement
af	acre-feet
afy	acre-feet/year
ALP Project	Animas-La Plata Project
ALPWCD	Animas-La Plata Water Conservancy District
BMPs	Best Management Practices
CDOW	Colorado Division of Wildlife
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
Colorado Ute Tribes	Southern Ute Indian and Ute Mountain Ute Tribes
Corps	U.S. Army Corps of Engineers
CR	County Road
CWA	Clean Water Act
DSEIS	Draft Supplemental Final Environmental Impact Statement
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
Interior	Department of the Interior
ITAs	Indian Trust Assets
M&I	municipal and industrial
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NEPA	National Environmental Policy Act
NIIP	Navajo Indian Irrigation Project
NNMP	Navajo Nation Municipal Pipeline
NOI	Notice of Intent
NTUA	Navajo Tribal Utility Authority
PMF	Probable Maximum Flood
Reclamation	U.S. Bureau of Reclamation
RM	River Mile
ROG	reactive organic gasses
RPA	reasonable and prudent alternative pursuant to ESA
Service	U.S. Fish and Wildlife Service
Settlement Act	Colorado Ute Indian Water Rights Settlement Act of 1988 (Public Law 100-585)
Settlement Agreement	Colorado Ute Indian Water Rights Final Settlement Agreement, December 10, 1986

List of Acronyms
(continued)

SHPO	State Historic Preservation Officer
SJRBRIP	San Juan Basin Recovery Implementation Program
SJWC	San Juan Water Commission
WAPA	Western Area Power Administration

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